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The
GEOGRAPHICAL JOURNAL

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THE RIO BRANCO, URARICUERA, AND PARIMA:

The second part, continued from page 143, *of the paper read at the Meeting of the Society,* 22 *March* 1926, *by*

DR. A. HAMILTON RICE

ON February 21 Hinton and Stevens set off from Kulekuleima up-river in the plane at 9 o'clock, and a half-hour later Bull arrived after a strenuous voyage from Typurema. On February 13 his canoe was capsized, and all his personal effects lost, including glasses, camera, and diary. This last, and the film of a big sucruriju he had shot, seemed to disturb him most. The plane returned at 10.55 a.m., having followed the river to a point known as the igarape Kueki (Karuanna), a black-water stream at an estimated distance of 75 miles from Kulekuleima. Caxoeiras are fewer than below, but there were two that looked large and long. Several likely places for landing were said to exist between Kulekuleima and the mouth of the igarape, and there also appeared to be favourable water above that point. The gasoline supply at Kulekuleima was too limited to allow any of the canoes provided with outboard engines to be used. These it had been planned to send ahead with gasoline either to the igarape Kulekuleima or to the mouth of the Aracasa river. Ultimately it was decided to send Bull forward in the Peterboro canoe with four Indians, as in that craft faster time could be made than in the heavier, clumsier batelões. On February 22 a shipyard was established on the beach, and repairs to the canoes carried out. Plans were made for selecting a crew to return to Purumame and bring forward the gasoline remaining there, to the amount of thirty-four cans. The men were willing to go forward, but none liked the idea of going back. It was previously arranged that the five men originally left at Typurema were to come forward with Dantos, when he returned up-river from that station. He pushed them as far as Purumame, from where however neither he nor Bull had been able to make them advance with the supplies that it was imperative we should have.

On February 24 Bull started up-river with four of the best Indians and 60 gallons of gasoline, with orders to establish a cache at the mouth of the Aracasa river, and Dantos started a couple of hours later for

Purumame with old Francisco and his crew of Jaricuna Indians to obtain the marooned supplies. There was at that time only enough gasoline in camp to work the wireless for one hard night, and take the plane to Boa Esperança. On February 26 the plane returned to Boa Esperança with Swanson, who was to remain at Boa Vista for a short time before proceeding down-river and home, while McCaleb was to come forward. Wireless advices from Boa Vista stated that the town was celebrating carnival, that it was impossible to obtain men, canoes, or supplies for some days, and that there had been considerable difficulty in obtaining horses to take McCaleb, the post, and other things from Boa Vista to Boa Esperança, where he was to meet the plane.

The next day four canoe-loads of Makús and Maiongongs arrived—men, women, and children—also innumerable dogs. One of the Maiongongs brought me a note from Dantos, saying that on February 24 he had met in the afternoon four canoes of Indians, who told him there was much farinha, macaxera,* cara,† and other foodstuffs a long way above, and that it was possible to go by canoe a long distance above where they lived, and he suggested purchasing their ubás on condition that they would make the voyage. Dantos said he was at that time close to the entrance of the north, or Santa Rosa, furo. A Makú in the first canoe to arrive spoke a little Makuxi, a Makuxi and a Taulipang of ours acting as interpreters. The Makú appeared to recognize certain Tupi-Guarani words and phrases. I afterwards found out he and his people had come, not many years before, from the upper Orinoco, above the Rio Padamo, in which country he must have at times heard some words of Tupi from the Baré Indians. The Makús at Kulekuleima had a big cache of beijú (hard farinha bread) as well as baskets of farinha. No one had been allowed to touch any of this, and some was now procured by barter. As the Indians found the exact amount that they had left here on their way down-river, a favourable impression was created immediately.

The Indians were installed in a large camp on the beach next to the camp of the Makuxis and Uapixanas, while the mulattoes and caburés had their own camp. It is always well to observe caste among these people and plan accordingly. Each differs in the food he wants and its cooking, and each is wary of the other. They should be kept apart where possible when engaged on such work as expeditions. The Indians, both Makús and Maiongongs, were short, fairly muscular, the women more stocky and stronger looking than the men. The children were well formed, and the colour was in every case number 4 of the Broca scale, an olive-brown.

On February 28 the river, having continued to rise steadily for four days, was several feet higher than when we arrived, in consequence of

* Manihot aypi (Pohl, *Euphor biacees*).

† *Dioscorea*, a creeper whose tuberous roots, white or violet in colour, are starchy and eaten baked or boiled, as is a potato.

which a large amount of water in going over the travessão formed a strong and dangerous caxoeira. This, however, the Makús ran in expert and beautiful fashion each time that canoes were transferred from above the fall to the beach below for necessary repairs. There was no mistaking the Makús as expert river Indians, well versed in canoe navigation and management. Two of the men from Boa Esperança essayed to do the same thing in a fast canoe Dantos had brought up from Boa Esperança, and from the crest the canoe was thrown bow down into the maëlstrom below. Twice the craft emerged, and then disappeared to be seen no more, though two canoes of Indians searched up and down the river for an hour or more. It was with great difficulty and only by quick action on the part of the other men that the two were rescued.

On March 1 three ubás with the Maiongongs and Makús started up-river, leaving behind six men and one woman as guides and assurance that the others would go forward to prepare food and make arrangements for the expedition's journey. Great restlessness and uneasiness began to be manifest among the Indians from Boa Esperança, the obsession of returning home possessing them. Every sort of pretext was made as an imperative reason, and each day expended in tedious argument.

On March 3 the plane arrived with Hinton and McCaleb, also the post, medical supplies and a few essentials, as well as certain wireless apparatus. The day after, the United States was easily obtained and messages exchanged, but, curiously enough, Swanson at Boa Vista was unable to receive our communications. His were received at Kulekuleima without the slightest difficulty. They were to the effect that Couzens was taking up men and canoes from Boa Vista by launch to Boa Esperança, where others were to join, and that four canoes and twenty men would start up the furo Maraca in a day or two.

In the evening of March 5, while McCaleb was working the wireless, a jararaca-assu (*Lachesis lanceolatus*), the most poisonous of the Brazilian vipers, came along one of the wires to within a very few inches of McCaleb's hand, where he lopped the serpent's head off with a knife, never stopping to take the telephones off his ears nor allowing any interruption in the messages he was sending. A tapir was shot at and badly wounded that afternoon, but could not be found next day; probably it fell a prey to a jaguar, of which there seemed to be a number attracted to the camp.

Dantos arrived from Purumame on March 8. He had departed for this port on the morning of February 24, arriving there the next afternoon, but the return journey had taken ten days. The day after leaving Purumame the river commenced to rise rapidly, and two days later the caxoeiras were well-nigh impassable. The canoe was twice swamped, and on that day it was necessary to construct a bridge across a parana. On March 1 all the cargo was taken across the bridge, and at each turn above that the river seemed worse, the canoe having several very narrow escapes

from swamping. Less than a mile was made on that day. The next day there were signs of subsiding floods, but many bad caxoeiras were encountered, and twice it was necessary to drag the canoe overland. On the fifth day out from Purumame, the river continuing to drop, a good voyage was made, and on March 4, the river even more calm, a good run was made. It was not until March 7 that strong caxoeiras were continually encountered during the day, and on March 8 at dawn the calm waters of Kulekuleima came into view.

At noon of this day a big ubá from up-river with four Maiongong Indians arrived, two men and two boys, with a canoe-load of bananas, caras, pineapples, beijú, and farinha. One of the men handed me a note from Bull saying that he was established at the mouth of the Aracasa, estimating the distance at 112 miles, and that it had been accomplished in nine and a quarter days.

Early on March 9 the hydroplane with Hinton and Stevens started for the Aracasa, from which point it was planned to make a reconnaissance of the Rio Parima, if possible to locate the origin of the Orinoco in relation to the Parima, and to examine the topography of the Serra Parima.

On March 10, a narrow and small ubá arrived from down-river, with five Maiongongs. They were larger than those who arrived two days before. The new arrivals were streaked with achote. The next day Dantos departed down-river in the morning in his own big canoe with six Indians, three more going in an ubá purchased from the Maiongongs. The remainder of the Boa Esperança Indians consented to go up-river as far as the Maiongong malloca. The small canoe with five of the Indians returned in a few hours with a note from Dantos, saying that the canoe lost in the Kulekuleima caxoeire, February 28, was on some rocks about two hours below Kulekuleima, in a damaged condition, but nevertheless capable of repairs and of being salvaged into a useful craft. A crew was sent down and returned at sunset with the damaged canoe. The bow was split and the starboard side considerably sprung, but appeared to be in fairly good shape. This day was eventful, too, for a tapir wandered into the camp just after sunrise, and was shot by Wilshusen.

Next morning Shattuck started in the Peterboro with the crew of Makuxis—Jesuino, Soldano, Manduca, and another, in company with two ubás and the Maiongongs. The rest of the party were away at noon, written instructions having been left for Bento Coelho, who was working up through the south furo with extra men, canoes, and supplies, to send one canoe to Purumame for the farinha there, and to despatch another up-river to the Aracasa with coffee, sugar, and rice, as soon as possible. On March 13, while we worked up through Assahy caxoeira, the plane passed overhead, going to the east. There was a heavy rain falling, and there did not appear to be any suitable place of landing for miles. By a previous arrangement, the plane on its return down-river from the Parimá was to look for us, and to signal by circles, clockwise or counter-

Returning to malloca with mandioca from Kunuco plantation

Maiongong woman grating mandioca

Preparing mandioca for baking

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Maiongong woman using mandioca press

Young Maiongong woman, Kujuma

Maiongong woman carrying mandioca

clockwise, as to whether they would come down below or ahead of us, according to conditions for landing. We were at that time in a very bad spot for canoes, let alone for a hydroplane. At 3 o'clock we were past the worst part of the caxoeira, and out of the rock-filled portion of the river, but in a parana too shallow for a plane to land with any safety. At 4 o'clock we heard the whirring of the engine, and a little later the plane was discerned overhead, signalling that it would come down a short way up-river from where we were. Hard paddling and poling for forty minutes brought us out into a wide, deep part of the river. Just ahead was the plane, floating on the water, with the Peterboro and two ubás of Makús alongside. The plane was towed over to the left bank, where camp was made and time devoted to gleaning all information possible from the reports of Hinton and Stevens, concerning their reconnaissance of the Rio Parima two days previously. The plane did not have ceiling enough, nor sufficient cruising radius, to cross the great divide on the eastern slope of which the source of the Rio Parima was found, at an estimated distance of 70 miles from the mouth of the Aracasa. Both affirmed that near the source on the right bank, nor far from an igarape of no great length, was a house and clearing, but no signs of life. At 6400 feet elevation the hills of the west side of the river were only 1500 feet below them. They were deeply impressed with the country, its rugged wildness, beauty, and grandeur, the prevalence and great height of the waterfalls, the elephant-headed, hog-backed hills, the beetling scarps and successive galleries of forest, the masses of rock resembling ruined architecture (sandstone), the density and height of the woods, the clearness of the atmosphere, and the magnificent cloud effects.

They reported that the Parima river was extremely difficult or impossible for canoes, the whole of its length of more than 60 miles being a mass of white foam. On the map made by Stevens he had marked several special places as particularly bad. A short distance up from Kujuma he reported a stream coming into the Parima from the north, a river I knew to be the Auari. This river has its source not far from that of the Padamo, which enters the Orinoco a short distance above Esmeralda, and from the Makús I found this was the road used by the Maquiritares, Maiongongs, Makús, and any of the other Indians holding communication with those on either side of the Serra Parima.*

On the way up the Uraricuera, Dantos told me the Maiongongs were Maquiritares and spoke Maquiritare; that it was, in fact, their idiom.

* It was by that route that the Maquiritares were accustomed to travel from the Cunucunumo, which enters the Orinoco just at the west of Duida, and up which river Spruce went, January 1853, to visit Tussarí, a famous tuixaua of the Maquiritares. He related to Spruce the annual journeys that he and his people made to the east. According to Spruce's account, Tussarí founded a colony of Maquiritares at or near where Kujuma is to-day, and where stands the Maiongong malloca opposite the mouth of the Rio Aracasa, some time in the early 'thirties. Schomburgk, on his map, has the Maiongongs placed where they are to-day. That was in 1838.

Maiongong woman using manioca press *Young Maiongong woman, Kujuma* *Maiongong woman carrying manioca*

Later, after sending back by hydroplane to Boa Vista for a vocabulary of Maquiritare which was on board the launch, Maquiritare was tried with the Maiongongs at Kulekuleima, and it proved to be their language. On Schomburgk's map the Makús are placed about the position which they occupy to-day ; but the present Makú occupants at the head of the Rio Uraricuera have been in the country a comparatively short time. They came there from the Orinoco country within the last twelve years, driven out, apparently, by the ferocious warlike Guaharibos, who roam around the region on both sides of the Orinoco to the east of the Rio Ocamo on the north and the Rio Umauaca on the south. It was with a horde of these barbarians that my small party of eight Indians and two whites came into conflict on 20 January 1920.*

The Makús, however, may have been in the region longer than the Maiongongs. There is a history of their having occupied territory around the headwaters of the Majary, considerably to the east of where they now are, and of their having been forced by the Shirianas of that part of the Uraricuera to evacuate that territory, and to retreat up the Uraricuera to the Parima and around the serra Maiongong. The Makús are people who are continually hunted down on the west side of the Parimas. Throughout the whole Rio Negro country they occupy a very low place in the scale of Indian nations. They are, according to Koch-Grünberg and Ehrenreich, of the old original stock of the land, and have been down-trodden by later invaders of the territories originally held by the Makús. The Makús a few years ago had a mallóca on the Auari, a short distance up from the Parima river, but this has been abandoned and their principal house is at Tokixima-huaite, on the right bank at the head of a deep gorge through which the Parima tumbles and plunges for nearly 5 miles, emerging at Kujuma, just above the mouth of the Aracasa.

On March 14 the plane was off at 8 o'clock, with instructions to obtain photographs of certain places on the way down, to proceed to Boa Vista with orders to Couzens, and then to follow down as rapidly as possible the Branco and Negro to Manáos, where the plane was to be dismantled.

During the next few days there were extended smooth stretches of river between the caxoeiras, which, though in most cases long, are spaced farther apart than they are east of Kulekuleima. Hills are more prominent and frequent, the general aspect of the country rugged and forbidding. At the end of the second day above Assahy caxoeira, Takari caxoeira was reached, and camp made on the left bank of the north parana that is formed by an island below the caxoeira. Two hours were required to pass the caxoeira the next morning, and at noon the wide caxoeira of Malipayapong blocked the way. The river at that point changes from

* See *G.J.* 58, 321, Nov. 1921, "The Rio Negro, the Casiquiare Canal, and the Upper Orinoco," p. 340.

southing to easting, at a point where the travassão crosses. Immediately above the caxoeira on the left, a caño, Zaucubena, comes in. A couple of hours beyond that, a long flat-topped, mesa-like mass looms up on the left bank, Serra Marutani. An island and a large flat rock near the centre of the river were both passed, and camp made on the right bank. A serra, Cutaihiba, was prominent to the south. Intermittent rains persisted through the day. The following morning, March 17, very low stratus clouds obstructed everything, but the strong current, spume, and rocks which were met with just above the camp indicated proximity to the caxoeira Moo-dá,* or Murua, of Koch-Grunberg's map.

One great slab, a rock rising obliquely against another, its upper extremity bevelled off to resemble the long snout of an alligator, the Makús referred to as pedra cayman (alligator of stone). Upon a parallelopipedon plinth near by rises, as though carefully balanced, an equally large egg-shaped rock called pedra Moo-rá. Both these stone objects lie in the rock-strewn body of rapids just below the travessão, which crosses the stream at right angles to an island that is close to the left bank, at which point the river is elbowed from south-east to south-west. Flanking the right bank are four low hills.

The river yesterday and to-day was broad, for the most part. To pass caxoeira Moo-dá consumed the best part of two hours, and from a little after nine o'clock until noon we were northing, the river swinging to the south from that point, which seems to terminate the southern scarp of the Serra Marutani, a horizontal mass of white sandstone unconformably overlying the basement rock of granites and schists. Coming into the Uraricuera from the north is the caño Manone.

Skirting the right bank for an hour more, we came upon a hut with a fire that was still smoking, the camp, apparently, of Indians who were just ahead. We halted for breakfast, the roof affording protection during two hours' heavy rain which came on. From time to time it cleared, giving an opportunity to view Marutani and Kueki-hede. There were many low clouds and scud and the intervals between the rains brief, but long enough however to give glimpses of a bridal-veil falls coming off the cliffs of Marutani. At 5 o'clock a big bend in the river was reached, which marked three hills on the north side, where the river turns from northing to easting. Just to the east of the bend the caño Minikiari comes in from the north and to the south of the bend, some 5 miles below, the caño Motomoto comes in on the right from a group of hills. Near the caño an ubá was met with three Makús, two men and a boy, who were apparently coming down-river to meet us, and who presented us with eighteen pineapples and two dozen circles of beiju, of which we were running low. Camp was made on the left bank, 2 miles below caño Motomoto, where much paxiuba (*Iriartea exorhiza*), palmito, and aninga exist.

* The Makú name for the caxoeira.

Early on March 18 many hills on the right bank, called serra Motomoto, came into view, and at their southern end a caño comes in from the south, called Nanone. A long way to the south-west is a flat-topped hill which the Makús term Linepenone. At 10.45 a.m. a corredeira was passed, and on the right a caño, Alikelau. Half an hour after midday we passed an island near the left bank, and halted on the right bank not far above it for breakfast, where the river makes a sharp bend, suddenly changing from a south-easterly direction to west, and then due south. The last two days have been spent in traversing two big loops or " vueltos " of the Uraricuera. The first hour of the afternoon's rain was spent passing a U-shaped loop. It is convex to the north-east, and three serrinhas surmount the left bank. A crag-pointed serra is on the south or right bank. Two miles above that an old mallóca (tapera *) came into view on the right bank, which was passed at 5 o'clock, and ten minutes later the Makús pointed to an igarape of black water coming in from the south, which they termed Kenekailolaca, and where they affirmed were a house and people.

Just inside the igarape, which apparently had been cleared for a short distance up for a port, were a few ubás and some men, naked, dirty, badly nourished, their attenuated bodies daubed and smeared with a blue stain of genipapa that intensified their natural hideousness. These greeted us, and shortly afterwards brought great bunches of bananas, and were soon followed by the tuixaua, a pleasant old fellow who made signs for us to ascend the path through the woods to the mallóca, a well-built circular edifice with a conical roof, to whose tip was affixed a long branch, its end covered with leaves. The house had a diameter of 80 feet, and walls 3½ feet high. The interior was in total darkness, and at first the women were not visible.

There were some fifty people in all, about one-third of whom were females, short and stocky, all with very young children, one only a few weeks old. All were hideous, especially so when they crouched, hunched, and squatted. A disgusting caxiri (beer) of bananas was passed around in gourds, and was apparently what the community lived on, as there were no signs of the usual utensils for preparing mandioca, either within the house or outside. There were bows, arrows, spears, and blow guns, articles of the chase and household utensils, most of them of indifferent workmanship, though one young Indian † with a strong-looking consort—I could not make out whether she was a Shiriana or no—showed me with much pride an excellent assortment of fish spears, bows, arrows, and blow guns.

No steel implements were to be seen. All arrows and spears were

* Abandoned house.

† Probably a Waiki. Name applied to the Indians who occupy the left bank of the river around the region of Marutani. They are larger, stronger and more warlike than the Shirianas of the right bank.

tipped with bone or bamboo, but the stumps of the clearing in which stood the house looked as though they had been felled with axes previous to the burning that always follows in the preparation of a clearing, whether for house or plantation.

So repellent and unpleasant were the impressions created by these miserable people on some of the party as to cause a loss of appetite for dinner, and a generally unpleasant night was passed by all, in the miasmic varzea of the igarape. In the morning more bananas were brought—the only article of any kind they had to offer. They were a kindly disposed, inoffensive lot of individuals, for whom one could have only feelings of commiseration and pity. Koch-Grünberg had told me, months before, of their dirtiness and abject misery, an observation that was acutely verified on sight. The Makús, especially the young woman, seemed anxious that we should not consider them as connected in any way with the Shirianas, of whom they had a poor opinion. Rozendo, the doyen of the Makús with us, and my principal informant, gave the name of the igarape and place as Kene Kailolaca, but the young man with the outfit of bows, arrows, and spears assured me it was Kene Linepenone. The diversity of names of localities and physical features due to three distinct indigenous dialects renders any simplified geographical nomenclature of the region difficult.

The flotilla was under way a little after 8 o'clock next morning, and in three-quarters of an hour we passed an igarape of black water coming in on the right—the igarape Carucuri. In a little over two hours the igarape Montiapoli (black water) was reached, coming in on the left, just beyond which is located the house and roça (clearing) of Rozando, my Makú pilot, where a call was made. The house was elliptical shaped, 50 feet by 25 feet, with a roof the ridge of which was short and keel-shaped, above the pitch. The occupants were mostly women, children, and dogs, the first named engaged in making beijú cakes from mandioca. The house was smaller and less well constructed than the Shiriana dwelling below, but there was an air of more prosperity, industry, and granary wealth. Across the rafters were many bows, arrows, blow guns, quivers, spears, curari pots, mandioca presses, vessels, stools, hammocks, sieves, fire pans, fish traps, paddles, bark fibre, and big receptacles for caxiri, but no signs of feather-work. Caxiri (mandioca beer) was handed around in sliced gourds to every one, beijú offered, and small pots with fiery potions of Indian peppers, into which the beijú was dipped. There were also delicious bananas, both cooked and uncooked.

At an hour's ascent above Rozendo's house is a pedral of parallelopipedons of red sandstone on the left bank, past which was a strong corredeira, and in an hour more we were at Uaimiti or Uidxa caxoeira. There is a long tabular-shaped mass of sandstone on the right bank, known as Kolaxiga or Uaimiti, and high rounded hills on the left, the effect being that of a portal through which the river issues. Near the

left bank is an island, and the parana formed is used by the Indians as the most expeditious way in which to pass the caxoeira. The parana is, however, a succession of rapids and bad currents, fortunately not very long, and leads directly to the crest or travessão where cables and hauling have to be resorted to. From this point to Kujumá and up the Parima river to Kulaihia gorge the river runs over sandstone flanked by mesas and hills of the same. The Uraricuera is a consequent stream that has persisted in its channel from the time of its inception on the eastern aspect of the Guayana dome, and has cut its way as an original line of drainage through the unconformable bed of sandstone resting upon the infinitely older basement rocks of granites and schists.

Above Uaimiti caxoeira the river is narrower and there are many corredeiras to struggle against, poling being resorted to, except where the water was shallow enough to permit wading and warping. Twice the supply of poles (varas) was exhausted by their being broken or caught in the crevices of the river-bed rocks and lost, necessitating halting to cut new ones. The serra Uaimiti stands on the south or right side of the river, fortress fashion. The grimness is softened somewhat by the dense verdure with which nature has covered the pile, though where the scarred yellow-brown walls are exposed the boldness of the jointing and bedding and size of the blocks are apparent. The cliffs and precipices, ledges and galleries, rents and ravines are evidence of the demolition through erosion over epochal time, and characteristic of the type of ruined architecture peculiar to stratified rock of horizontal position. In the left bank there is, not the table-top outline of Uaimiti, but the flowing one of rounded summits that have been carved out by erosion from a plateau of accumulation, the rugged and bold scenery being of striking picturesqueness. Camp was made on the right bank, at the mouth of a small igarape. Rain had commenced to fall at five o'clock, and continued intermittently through the night.

We left at seven o'clock on March 20. Both shores were flanked by serras of the same character as on the previous day. After an hour's advance upstream a strong corredeira necessitated separating the canoes which were lashed to the two provided with outboard engines, and each had to be warped singly upstream with cables and by pushing. An hour before noon the mouth of the Aracasa was reached, where Bull had established a camp from which Hinton and Stevens had flown up the Rio Parima to its source on March 11. They departed from here again for down-river two days later, meeting us that afternoon above Assahy caxoeira, Bull and Siméon, the Makuxi, awaiting our arrival. Continuing up-river an hour and a half more, we pitched camp on the right bank, a short distance above the Maiongong mallóca, a small igarape and woods interposing. It was at the end of a gorge of the caxoeira from which the brown-coloured river races, forming vortexes and whirlpools that spin off spume and backwash along either shore. Trees were felled to

open a space for the wireless station and camp site, and for material with which to build a cookshed and storage hut. In the afternoon the Maiongong contingent arrived with bananas and sugar-cane, anxious to trade, but expecting huge returns of steel implements and cotton cloth for comestibles of which they have plenty, and that for this reason, if no other, merited no such prices as were asked. The tuixaua pretended not to understand a word of Spanish, Portuguese, nor Tupi-Guatani. It later was disclosed that he possessed a slight knowledge of Spanish, certainly understood some words of Portuguese, and was sharp and shrewd as a horse trader when engaged in the commercial relations of barter and exchange. He conducted all negotiations for his people, and worked as hard to obtain full measure for each of them as for himself. He was obdurate and independent, and invariably held out for the first article demanded, never acceding to a more moderate fee for either his foodstuffs, goods, or chattels, upon all of which he placed, for an Indian, exorbitant values. The Makús were much more amenable and nicer in every way to deal with, being reciprocative and reasonable, and proving themselves loyal, alert, hard workers. Not a stroke of labour did the Maiongongs do, and they were always evasive as to every proposal for getting ubás from them and enlisting men from among them for the up-river work.

On the evening of the day of arrival at Kujumá, there was a dabocuri at the mallóca for the strangers from down-river. The affair dragged monotonously on for hours. Huge quantities of caxiri, that gave off a sour and nauseous odour, were consumed. Jesuino, the Makuxi, well known to the Maiongongs by reason of matrimonial affiliation, was honorary master of ceremonies, bedecked with a string of a dozen sari birds hanging down his back and beating from time to time in a perfunctory way a native drum adorned with wild pig's bristles. Old Francisco, the Jaricuna tuixaua, bore aloft in his right hand a staff, and alternately chanted and intoned some monotonous refrain that kept the group of performers in motion, whirling, circling, stamping or limping the dolorous chorus accompanied from time to time by an accordion, whose manipulator managed to press out the well-known, widely used Rio Negro Indian refrain of three notes—the rhythmic measure that I have heard played on everything from a reed syrinx and bone flute to an imbaüba pounder and palm bassoon, in every mallóca of every river I have travelled upon in Colombia, Venezuela, and Brazil. At this dabocuri the crews from down-river, or as many as could be induced to join, took part, while the host looked on, but all participated in draughts of caxiri. After each libation the dance became more ragged, dizzier, and more dirge-like, and movements lost orientation. A dabocuri, when well done, such as is carried out in the great mallócas of the Rio Caiary Uaupés, in which many participate, and where the rituals and rites are adhered to, and the dancing and music are enhanced with all the panoply

of custom and accoutrement, is well worth watching; but its duration through a period of several days becomes a nuisance and most vexatious, as all work is interfered with, and one's Indians are demoralized.

The next day most of our men were in no condition for work. A desultory amount was done on the trail and a certain number of trees felled. The majority were ready and anxious to go down-river, in fact the hardest work done on this day was the discussion of departure. Both the tuixauas, Francisco and Alberto, had been promised release, all of their men being anxious to accompany them. Raymundo caburé was also instrumental in inciting trouble, and several men were lost through his machinations. Rozendo and his Makú party arrived from down-river and went into camp on the down-river side of our wireless station. All his women and children came along, as well as the men.

On March 23 one of the batelões and the old Peterboro canoe were allotted to the men to go down-river in, Jesuino using his own ubá. Thirteen Indians in all decided to depart. Candido, a very useful fellow who had served several years with General Rondon and bore the marks of arrow-wounds from several conflicts, suddenly found himself obliged to go to Manáos for his army service. It soon developed, however, that he thought he was not receiving pay commensurate with the others, and that little matter adjusted, the absolute necessity of his having to return was found no longer to exist. Raymundo also discovered that the money he would make by staying on was more to his advantage, and he too decided to remain, and now tried to influence Andrade, the Taulipang, a most valuable man, and others who had succumbed to his scheme for departing down-river. These refused to change their minds. The next difficulty was to get the Indians off, as the longer they stayed the more likelihood there was of trouble.

We went to the Maiongong mallóca the next morning to obtain farinha and beijú, as well as to see about ubás for up-river. All the Boa Esperança Indians were there getting farinha and other supplies for the down-river journey, but their departure was effected by noon. At the back of the house the land slopes sharply down, away from the river, and there is a large roca, in which mandioca, bananas, pineapples, cane, peppers, carás, cashews, and other products are cultivated. Cotton was also being grown, as well as pita (caduau), and there were many tucumá, bacaba, and palmito palms. The house, elliptical in shape, with cubicles closed off, running concentrically with the walls, was entered from the outside, through apertures similar to dog-houses or rabbit-hutches, the quarters being more curious than commodious. Within there was the hum and activity of a human beehive, the central inner living chamber filled with female occupants engaged in studding the mandioca grater boards with particles of flint, which I was assured came from the serra Pacimi, at the head of the Aracasa, in twisting cord from fibre, in pulling and washing cassava roots, and in baking beijú, while

Young Maiongong with bow and arrows

Maiongong Indian

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Maku Indian

Nicolau, Maku pilot, Upper Uraricuera

Maku mother and child

the men looked on and the children engaged in mischievous activity that was peremptorily halted from time to time by cuffs and pushes delivered directly and summarily by the mothers. The women were dour in demeanour and sullen in manner. All wore their hair cropped and had short, squat figures, big-boned limbs, and heavy stolid faces. One pathetic little figure, hidden behind a mandioca grater, was dragged forward for my inspection, a male hunchback child, upon whom a tree had fallen, so injuring the cervical vertebræ as to cause an anchylosis and resultant deformity of the shoulders. He apparently felt keenly his abnormal physical appearance and limited activities, and was always trying to hide or skulk away, holding aloof from the other children—his spirit crushed as well as his spine. In the malloca were bows, arrows spears, graters, presses, stools, sieves, baskets, pots, some heavy axes, machetes, and worn-out knives, the last three classes of steel instruments coming probably from the Maquiritares in Venezuela. To this picture of the Maiongong habitation should be added much dirt, miry ground, and the sour stench of the mandioca fermentation. At the mallóca were some visiting Maiongongs from the Aracasa—taller, better built, more attractive-looking individuals than those of Kujumá, and there were some Makús as well from Tokixima-huaite, located at the end of the trail above the falls. One had been bitten by a snake some days before. The fangs had gone in just behind the internal malleolus of the right leg, which was marked by redness and pain around the points and some swelling of the leg above. The usual apprehensive, disturbed, nervous condition was also noticeable.

That afternoon the visit on the part of the Maiongongs was returned, and they came to our camp with a fleet of canoes. Among them was a woman of much lighter skin than the others, said to come from a Maiongong settlement high up on the Aracasa. She was carrying a baby that was typically Indian in appearance. Comparison of the woman's skin with the Broca scale showed the tint of her skin to be between 6 and 7, which are, respectively, yellow or light olive and yellow-white. The ordinary South American native's tint corresponds to number 4 of the scale, dark yellow-brown, or dark olive. The iris of the eye corresponded to A of the medium shades of the same scale. Her hair was black, distinctly Indian. She was short, thick set, with features more Caucasian than Mongoloid. It must be borne in mind that the words "white Indian," or "indio blanco," are not to be taken literally, but rather as a term to designate a South American native that is of a lighter tint than the average forest Indian of that continent. It is a difference of degree of tint rather than the radical distinction of two separate colours.

The usual work incident to trail cutting, cargo portaging, farinha making, and attending to the sick and ailing went on until April 4, when the entire party moved over the trail to the camp opposite the Makú mallóca, at Tokixima-huaite. There had been a certain amount

Maku mother and child

Nicolau, Maku pilot, Upper Uraricuera

Maku Indian

of trouble with the Maiongongs, stirred up first, presumably, by Jesuino and some of the other Indians who, before departing down-river, had worked up the Maiongongs by exciting their suspicions as to our real intentions and suggesting the direful results inevitable to all concerned which would follow invasion of the contiguous hostile country, engendering at the same time a bad feeling between the Maiongongs and the Makús. The utmost care was taken in all dealings to be fair and just. It would have been an easy matter to have surreptitiously taken from the Maiongongs the ubás that we needed, and to have impressed into service the men necessary to work them. Their mallóca could have been fired and the roça destroyed, for against our machine guns, rifles, and revolvers the Maiongongs with bows, arrows, blowguns, and poisoned darts could do but little. The after effects, however, of such tactics are inevitably deplorable. The Maiongong tuixaua, wary and wily, worked to keep up a pretence of friendliness until he and his people had obtained the cloth and steel instruments they desired, then he planned to withhold all support and aid, hoping thus to compel us not only to give up invading the unknown territory to the south-west, but also to effect our retirement from his own territory. The Makús he held to be too few in number and too poor to render assistance of any account, thereby disregarding the one factor that foiled his own machinations.

The day following our arrival at the upper camp, Palm Sunday, the Makú tuixaua arrived, bringing farinha, beijú, caras, bananas, sugar-cane, and pineapples, and thereafter every day was a regular caller, trading, inspecting, and conferring on the forthcoming dash up the Parima river. While at Kujuma I had carefully interrogated Rozendo and Nicolau on the existence of a route from the Parima to the Orinoco. Rozendo said the only one was by the Auari, a river coming in to the Parima from the north-west, not far above our present situation. He affirmed that on this river there used to be a house and people, but that nothing existed now, that it was five days from near the head of the river by a road which went over a high serra to another river, down which it was necessary to go for five days, in order to arrive at the Orinoco. Rozendo and Nicolau both recognized the Cunucunúma, Duida, Maraguaca, caño Iguapo, Esmeralda, Gabirima, the Maquiritare settlements on the first-named stream, and others between Duida and Maraguaca. Given a crayon and piece of paper, Rozendo slowly and deliberately started an oblique line toward the top of the sheet. This he called the Rio Auari. At a point on the right bank he started a path away from the river, and indicating it as crossing a serra. The tracing was closely watched, commented upon, corrected, or commended by Nicolau. Laboriously drawn from the serra was another river, connecting at an acute angle to a line indicated as the Orinoco. "What river is that?" "Rio Padamo" came the answer, which I recognized as Schomburgk's old

route in 1838,* apparently the only road known to the Makús, Maiongongs, and Maquiritares. Rozendo and Nicolau were both firm in their conviction there was no road from the end of the Rio Parima to the Orinoco—only a high serra peopled with bad Indians (bravos) whom all the others kept away from. They said at first there was a house belonging to the Shirianas, then affirmed it was a dwelling of bad Indians, and finally acknowledged they didn't know anything, as neither of them had ever been there.

The Makú mallóca at Tokixima-huaite was a small affair in a close clearing. It was cylindrical, with 5-feet-high wall of wattle and daub construction. Surmounted by a cone-shaped roof of palm thatch, three doors gave entrance to the house, one leading directly to the round central chamber, the other two opening into the three cubicles that are concentric to the inner circular chamber. In the roof was a window that could be raised to admit light and air, or closed by ropes, after the manner of a sky trap-door. There were the usual weapons and utensils of a mallóca, as well as women, children, dogs, and fowls, but the community aspect was that of a poor, small, and struggling one, fighting hard for a precarious existence. There was a "moquem," † upon which hunks of a tapir were being smoked, while the diminutive youthful third wife of the tuixaua vainly tried with her tiny hands to scrape and clean the whole heavy decapitated head of the animal, her lord and master sitting by, issuing orders as to the fire, and criticizing basketwork or other specimens of female industry that were presented for his inspection and comment. Inside the house I espied numerous specimens of the expedition's food supplies, purloined by our own men for trade or concealed as cache for future use, perhaps when a precipitous flight would be attempted or some form of quick get away—a contingency not pleasant to contemplate. The chief plotter of that plan was suspected to be Raymundo, whom the Makús looked upon with evident dislike.

(*To be continued, with the second half of the map, in the April Journal.*)

* See map "Reisen in Guiana und am Orinoko, wahrend der Jahre 1835–1839." Robert Hermann Schomburgk. Leipzig: 1841.

† Moquem or mocaém, the "pacera" of the Spanish. *Vide* p. 140, footnote.

THE SURVEY OF THE LUBAANTUN DISTRICT IN BRITISH HONDURAS: *A paper read at the Meeting of the Society on 5 December 1927 by Major Cooper Clark in the absence of the author,*

GEOFFREY LAWS

EARLY in February 1927 an Archæological Expedition, under the leadership of Capt. T. A. Joyce, Deputy Keeper of the Department of Ethnography and Ceramics at the British Museum, left England for British Honduras to investigate the ancient Maya site known as Lubaantun, in the southern part of the colony. To this expedition I was attached by the Royal Geographical Society, firstly to determine by astronomical methods the exact position of Lubaantun, and secondly to produce a topographical map of as much of the surrounding country as was possible in the time, for the benefit of future expeditions. In doing this I drew freely upon existing material, and the resulting map (following p. 320) is a compilation of traverses by the Survey and Forestry Departments, as well as my own work based upon and adjusted to a number of independent astronomical positions. And I wish here to acknowledge my indebtedness to the Surveyor-General and Conservator of Forests and to officers of their Departments, for placing unreservedly at my disposal all available information regarding the district in which I was working; and, further, to express my appreciation of the unfailing courtesy and hospitality of all local residents, official and non-official, with whom I came in contact, whose influence and local knowledge went far towards making possible the work I had in hand.

The area under survey lies in the Toledo District, the southernmost political division of British Honduras. Its centre is the complex of ancient Maya ruins called Lubaantun, which the British Museum party went out to investigate and which lies in lat. 16° 16′ 52″ N., long. 88° 57′ 54″ W. Orographically the area may be divided into two parts. First, a belt extending some 15 miles inland from the coast, flat, forest-clad, and rarely rising above the 100-feet contour line. The monotony of this belt is broken here and there by abrupt limestone hills, rising suddenly from the plain to an elevation of 400 or 500 feet, and, except in rare cases, forest-clad to the summit. In addition, there is a wide swampy area lying between Crique Piedra and Mafredi Creek, where only coarse reed grass and a little low scrub can grow; and a narrow "pine ridge" between Condemned Branch and Crique Piedra. Secondly, a little east of the line joining the three Indian villages of San Pedro Colombia, San Antonio, Aguacate, the ground begins to rise, and from here westwards to the Guatemala boundary we have an area of hilly country, the elevation increasing westward to between 1500 and 2000 feet. The underlying rock is all a soluble limestone, giving rise to those characteristic features of waterless valleys and underground drainage

which, combined with the generally forested nature of the country, present great difficulties to the topographer in the elucidation of the drainage system.

Lubaantun lies upon the line dividing these two orographical units, close to the village of San Pedro Colombia, at the head of canoe navigation on the Colombia river. The ruins are in the angle formed by the confluence of two small tributaries of this river. From here eastward one looks across the wide expanse of the flat coastal plain to the sea and the mountains of Guatemala across the Gulf of Honduras. Westward the view is obstructed by steep and irregular hills which are the commencement of the area of bolder relief. The ruins themselves, close to the river-bank, lie between 100 and 150 feet above the sea, while the adjoining hills rise to something over 300 feet. The highest point in the immediate vicinity, about half a mile due west of the ruins, has an altitude of 375 feet. In this broken area, intersected by many small watercourses, are found numerous traces of pyramids and terraces similar to, but on a much smaller scale than, the principal ruin.

The climate is warm and damp. The rainfall of Punta Gorda is the highest recorded in the colony, and occurs almost throughout the year, reaching a maximum in the months of June, July, and August. Although March, April, and May are the dry-season months, there was not, during all the time we were there, one clear week without rain. These conditions give rise to the typical Tropical Rain Forest and that high fertility which, elsewhere, supports some of the densest populations in the world.

It is remarkable therefore that this district has, practically speaking, no indigenous population. There are two areas of population: the Indian Reserve in the hilly country, and the fishing villages of the coast. In the former the Indians are all migrants from the adjoining districts of Guatemala, whose advent is almost within living memory; in the latter the inhabitants are all so-called Caribs, who however have very little true Carib blood and are almost pure African native, imported when the slave trade was at its height. Present-day economic conditions tend neither to stabilize nor increase the population. The sugar and chicle trades are moribund, whilst the mahogany cutter only establishes a temporary camp for a year or so and then moves on. Transport difficulties effectually prevent any agricultural development. The Indians are beginning to talk of moving again, since owing to their method of *milpa* cultivation, which requires a fresh plot of virgin ground for each year's crop, they are already feeling themselves pinched for space.

The only important economic product of the district is mahogany. Its production is becoming more difficult year by year, and since the work of the Forestry Department was only begun a few years ago, it must at present be regarded as a wasting asset. Originally the trees were felled close to the river-banks, and thence floated down to the coast when

the river was sufficiently full. Now, often as much as 10 to 12 miles of tractor road is required to haul the logs to the nearest point whence they can be floated down. The bleeding of chicle for chewing gum has already passed out of the district; the sugar trade has been killed by low prices and restrictions on rum; although fine cattle are produced on the ranches around Punta Gorda, they are of little value for want of a market.

The party reached Belize on the morning of March 8. I was fortunate in finding that two officers of the Forestry Department were going down to Punta Gorda on the 10th, who very kindly offered to take me down in their comfortable motor launch. It is a long day's journey down the coast, between the mainland and the fringe of outlying cays, the latter sometimes quite close inshore, sometimes so far out as to be out of sight. The flat lowlying coast of Belize district soon gives place to a bolder relief, the ground gradually rising to the central high lands of the colony. Of these the highest point (the Victoria Peak of the Cockscomb Range) reaching to nearly 4000 feet was passed about midday, though only dimly visible owing to haze. As the afternoon wore on the ground fell again and the coast remained flat and low-lying until the characteristic sharp peaks of the Punta Gorda district came into sight.

On arrival in Punta Gorda I immediately found myself up against the transport difficulty, with which I was to contend throughout the trip. For the efficient working of a survey party facility of transport is essential, for not only does the surveyor require a maximum of mobility, but he is inevitably cumbered with a large quantity of instruments and stores. Over and above this the extremely sparse population made it impossible to rely on local food supplies, so that all food had to be carried. The three available means of transport are canoes, pack-animals, and Indian carriers. The canoe is convenient but slow, and restricts movement to the neighbourhood of navigable rivers. Pack-animals were in this district so scarce as to be almost unobtainable, and moreover can only be used on recognized village-to-village trails. The Indian makes a sturdy and tireless carrier, but, the dry season being the planting season, he was unwilling to leave his farm for any length of time. Besides this there exists no carrying tradition, local Government officials and others being content, as a rule, to travel with a couple of saddlebags.

It took three days to arrange for the transport of all my material over the 21 miles from Punta Gorda to Lubaantun. Eventually I secured two mules to carry the 6-inch theodolite and wireless receiving set overland, while the remainder of the stores were sent up-river by canoe—a three-days' journey.

With the two loaded mules I left Punta Gorda on the morning of March 14. The first 6 miles of the trail is a motorable road passing through the ranches of the "Toledo Settlement," an old-established but now decaying American colony, where most of the ground is cleared

and affords very respectable grazing for cattle as well as sugar plantations. Beyond this we plunged into the forest. Large trees are here comparatively scarce, the average of the forest being rather low and characterized by the ubiquitous Cahoune palm. Owing to the fact that pack-saddles had been absolutely unobtainable in Punta Gorda we had considerable difficulty with the rather awkward loads, and frequent halts for adjustment were necessary. The "Carib" of the coast is essentially a fisherman, and is not used to animal transport. Progress was therefore slow, and it was well on in the afternoon when we stopped for an hour's spell at the crossing of Crique Piedra with a third of the journey still before us. As there was a nearly full moon I determined to push on, but darkness fell soon after we had resumed our journey, while the forest effectually obscured the moonlight. Where the trail was open progress was only impeded by the broken and boggy nature of the ground. These trails are however constantly being blocked by fallen trees, and a wide *detour* is necessary to avoid the obstacle. To make such a *detour* and regain the trail in the dark is no easy matter, so that our progress became increasingly slow, and it was midnight before we finally reached the village of San Pedro Colombia. Here I woke the schoolmaster, who took me across the river to where Mr. J. E. Thompson was camped among the ruins, which in the blaze of moonlight looked unusually impressive.

Two members of the expedition (Messrs. Thompson and Hannay) had been at work for a week or so, and the ruins were already cleared of the growth (12 to 15 feet in height) which had sprung up since the previous season. A spacious palm-thatched hut (later supplemented by another) had been erected. The morning after my arrival I established my first astronomical station on the top of Mound D (see Capt. Joyce's plans of the ruins). The transport question had already eliminated the frame aerial, which was far too heavy and bulky to be packed on the mules, and had to be left to follow by river. I erected, therefore, a wire aerial at a mean height of about 16 feet with a counterpoise of a similar length of wire, though this latter was afterwards found to be unnecessary. With this arrangement I was enabled without difficulty to pick up time signals from Balboa (Panama) and Annapolis (Washington).

A series of clear nights enabled me to work through a satisfactory star programme from which sixteen stars were selected for the final fixing. During this time I started a plane-table sheet from a subtense base measured in the ruins and extended by four triangles to a 6-mile side. In spite of the generally forested nature of the country plane-tabling proved feasible within the Indian Reserve, owing to the local method of cultivation. The Indians clear a fresh patch of virgin land every year for sowing, leaving last year's farm to revert to bush. In this way a very considerable area is either cleared or covered with secondary growth only a season or two old, which is easily cut. Beyond the confines of the Indian Reserve the use of the plane-table proved impossible, and the

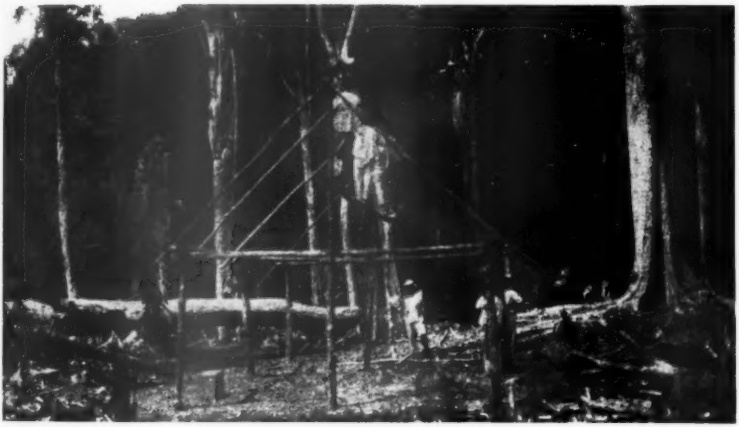
only practical method of survey was that of compass traverses of paths and rivers controlled by astronomical positions.

The restrictions imposed on movement by transport and food supplies made it necessary to cover the country in a series of short trips of not more than a week or ten days' duration, from an established base for equipment and stores. Making Lubaantun my base, I started my first trip on March 29, when I moved to San Antonio, the largest Indian village of the district, about 6 miles from Lubaantun. Here I found very comfortable quarters in the " Cabildo "—a spacious mud-walled building in an elevated and airy situation. The Cabildo combines the duties of court house, lock-up, general meeting-place, and European rest-house. During the day it was given over entirely to the latter function, but about sundown the menfolk of the village, returned from their farms, would drop in for a smoke and a chat. It was then that village affairs were discussed and business done. Attendance was merely a matter of inclination and habit, but if there was any matter under discussion which required the attendance of every one a drum, which was kept in the Cabildo for the purpose, was beaten as a signal. The presence of a European inhabiting the house in no wise interfered with these meetings, though native courtesy would often prompt one who spoke English to keep the visitor *au fait* with the discussion. These meetings were a valuable opportunity of gleaning information about the countryside and arranging for guides, carriers, etc.

On April 4 I left San Antonio for San Antonio Viejo, a little village about five hours' march farther west, and, as its name implies, the locality of the previous settlement of the San Antonio Indians before they moved to their present site. After crossing the Rio Blanco the trail rises steadily until San Antonio Viejo is reached at an elevation of slightly over 1000 feet. We arrived at the village (a settlement of ten houses and as many pigstyes) about three in the afternoon, and went to the house of the Alcalde. Here an unexpected check awaited us, for the Alcalde, on hearing who I was and what I was doing, immediately inquired for my authority to enter Guatemala. It appeared that the International Boundary in this neighbourhood had never been actually demarcated, and San Antonio Viejo considered itself to belong to Guatemala, the Alcalde being appointed by Guatemalan authority, although actually the place is some miles within British territory.

A recent murder has, I understand, brought the question of the nationality of this village to a head, and a boundary commission is being organized to locate the line once for all. At the time however there was no doubt that the local authority was Guatemalan, and in the course of a discussion which lasted most of the afternoon it became clear that, while he had no objection to my staying in the village, the Alcalde could not allow any survey work to be done in the neighbourhood without authority from San Luis. As it would take four days for a man to go to San Luis

Diablo Grande Falls, Rio Grande



Building hut at Lubaantun

Clearing the site of Lubaantun

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Looking south across F and G complex

South wall of Mound D after excavation

At work on the ruins

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and return, I decided to move on to Aguacate the following day. This trail, though short, is very ill defined and involves climbing to the top of a limestone ridge about 1500 feet above sea-level, and then descending once more to plain-level, Aguacate lying just below the 200-feet contour line. Aguacate proved to be quite a large village, and had a well-built Cabildo at the disposal of the casual visitor. I had made another astronomical fixing which I was able to connect up with my plane-table framework.

I left Aguacate on April 11, sleeping that night on the bank of the Rio Blanco, a mile below the point where it reappears after passing underneath the limestone ridge which runs parallel to and south of the San Antonio–San Antonio Viejo road. This is the second considerable stream which tunnels below this ridge, and will be referred to later in connection with the underground drainage of the district.

The following day I returned to Lubaantun *viâ* San Antonio, to replenish stores, and also because Easter was approaching, during which festival all work is out of the question. A Jesuit mission has long been working in the district, and the Indians had for weeks past been preparing for Easter, not only by decorating their houses and churches, but also by laying in as large a supply of rum as their means would allow. The celebration of the festival reminded me very strongly of Christmas 1925, which I spent in a small Ibo village 20 miles inland from Onitsha on the Niger. The only difference was that while the African medium was palm wine, the Central American was white rum. In one house I entered in San Pedro Colombia was a long table standing across one end of the hut. On one end of this stood an Easter shrine, whilst at the other a swarthy " Spaniard " was dispensing rum at ten cents a glass. In the same village several performances were given of a traditional Spanish costume dance representing the expulsion of the Moors from Spain, the church being used as a dressing-room for the dancers.

So unsettling was the effect of these celebrations that it was not until the following Thursday that I was able to get together a party to accompany me on my trip to Esperanza—a deserted chicle camp two days' journey north of Lubaantun. The gang I had engaged at San Antonio the previous week entirely failed me, and it was only through the patient efforts of Mr. Hannay that I eventually got five men to come with me. It is characteristic of these people that, though they showed the utmost reluctance in taking on the trip, once they had contracted to go they proved unfailingly cheerful throughout, and took long marches, hard work, and short commons without a murmur.

The question of the underground drainage of this part of British Honduras is still very obscure, and certain points of geological history which arise would make its further investigation of considerable interest. The trail from San Antonio to Esperanza crosses a series of streams of varying size all flowing easterly. Following the road that leads north-

wards from Lubaantun to the Rio Grande we crossed several streams, some with water even at this season, flowing westwards, *i.e.* into the same basin as those crossing the San Antonio trail. Immediately to the north of the Colombia branch the ground rises to a considerable elevation, so that it is to be assumed that all these streams drain into the Rio Grande and not the Colombia. And yet, following the waterless course of the Rio Grande up to the cave where it first appears, we passed only one tributary on the southern bank—the inconsiderable and entirely dry Crique Mamay. The water of all these streams must therefore pass underground and join the Rio Grande before its own water reaches the light of day at a point some 5 miles below the place where we first struck it.

In addition to all these is the Esperanza stream. At the old chicle camp this stream, flowing southwards, is some 20 feet wide and contains a fair volume of water even in April. It is probable that this too becomes a subterranean tributary of the Rio Grande, although I was informed by one of the Indians, on what authority I do not know, that it holds its course due south, passing beneath one range of hills, and is, indeed, the river which flows past San Antonio Viejo to become eventually the Aguacate Creek.

Yet more remarkable is the case of the ridge which runs to the south of and parallel to the San Antonio–San Antonio Viejo road. This ridge is pierced by two considerable rivers which flow in caverns beneath it—the Aguacate Creek and the Rio Blanco mentioned in a previous paragraph. The identity of the Rio Blanco is established beyond doubt, as some mahogany logs were actually floated through some years ago. These did not reappear on the south side of the range for three years; but whether they were eventually liberated by an exceptionally dry or exceptionally wet season (*i.e.* whether the obstruction is above or below the normal water-level) I was unable to ascertain. The fact that these two rivers pass beneath a range which rises some 1000 feet above their present beds indicates a great antiquity, for the present drainage lines must have been in existence before that range of hills began to be carved out. In some cases it appears that the underground channel is insufficient to carry the flood water in the wet season, and an overland channel also exists. The Rio Grande has a waterless course of about 10 miles between the cave where it originally appears and the point where the water comes to the surface. The trail from San Antonio Viejo to Aguacate crosses the Aguacate Creek in two places. In the first, just at the foot of the hills, it is entirely waterless, while in the second close to the village it carries enough water for canoe navigation.

The main difficulty of our journey to Esperanza was the want of water. The old chicle camp was closed down seven years ago, and the district is now entirely uninhabited. The drainage of the greater part of the ground we had to cross was, at this season of the year, entirely underground, and only very occasionally a spring is met with whose water,

after flowing a few yards above ground, will disappear once more. We started our first day's march along one of the many tractor roads now cut for hauling mahogany to the river-banks, and the going was rapid and easy. About 10 a.m. however we left this road, and for the rest of the day followed the course of the Rio Grande, here entirely dry, its bed a channel of fantastically tumbled boulders. After leaving the tractor road it became necessary to cut our way through the undergrowth, there being no well-defined trail, and progress was very slow. About 4 p.m. we camped by the river-bank, our water supply—the only water for miles—being a little pool of rain-water collected in one of the pot-holes of the river-bed. Shortly after starting next morning we came to the place where the Rio Grande issues from a cave at the foot of a 150-feet limestone cliff.

After leaving the Rio Grande cave we began to climb steadily, and as the altitude increased the scenery became more rugged and broken, the trail climbing between steep peaks and ridges, while here and there a cliff face of brilliantly white limestone would show through the trees across some precipitous gorge. We reached our highest point (about 1600 feet) at midday, and thence dropped some 300 feet to Esperanza. There was of course no trace left of the old chicle camp, and we cleared a dense patch of wild bananas by the river-bank, where we pitched a camp from which I was able to obtain an adequate if restricted view of the heavens.

Within a few hundred yards of the camp the trail crosses two irregular mounds of small limestone blocks, which the Indians pointed out to me as the ruins of ancient Maya pyramids. These were the only traces of ancient buildings I came across beyond the immediate vicinity of Lubaantun.

It was unfortunate that at Esperanza I struck a patch of bad weather, the first sign of the approaching rains. The restricted amount of food we could carry only allowed us a stay of three nights. There was a considerable amount of rain, and owing to the altitude a thick mist came down between 1 and 2 a.m. every night. Observations were obtained to three stars only in the course of the three nights. Moreover, conditions for wireless reception were extremely bad, the clearing being surrounded by heavy forest and encircled by hills rising 700 or 800 feet above us.

After the third night we started to retrace our steps. The return journey was done very much more rapidly than the outward one, as no cutting was required, and we were travelling downhill. We reached Lubaantun again on April 26.

Having now covered as much of the inland part of the area as my programme allowed, I determined to move my base down to the coast, particularly as the archæological party were already preparing to leave. The obvious place to use for the centre was Punta Gorda, the only settlement of any size on the coast, with all the facilities of a post office and

stores at hand, and where I was kindly made free of the comfortable rest-house belonging to the Forestry Department.

The journey down was made by canoe on April 28. All canoe travelling is apt to be monotonous, and at this time of the year it was rendered exceptionally slow by the lowness of the water. The Colombia branch as far as its junction with the Rio Grande is a succession of small rapids with never more than a few hundred yards of deep water between them. These rapids have rarely more than a few inches of water over their gravel or rock bed, quite insufficient to float a moderate-sized canoe. Our progress therefore was punctuated every few minutes by the grounding of the canoe, when the paddle men must get out and by main force haul it over the shallows. Another hindrance to navigation is found in the numerous fallen trees which in many cases stretch from one side of the river to the other. On the Colombia, where there is a constant traffic in stores and gasoline to the mahogany camps higher up, these are cut so as not to form serious obstacles, but on many of the less-used streams, where there is little traffic, the use of the machete is as necessary as when opening a trail through the forest.

When the Rio Grande was reached progress became much easier, the only serious obstacle being the " Big Fall," where a rocky bar across the river makes an actual fall of about 4 feet. Soon after passing this the character of the river changes to the sluggish meandering typical of a flat coastal plain. We reached the mouth of Jacinto Creek at sunset and there spent the night, moving up to a cattle ranch 2 miles from the river, where I spent the next few days by courtesy of the owner, Mr. T. Watrous, who was away cutting mahogany up the Colombia river. We were here only 5 miles from Punta Gorda, to which place I moved on May 5.

This little town had once the prospect of becoming quite a considerable trading centre. There was enough water for small ocean-going steamers to come in, and a large coastwise trade by motor boat and schooner. The Toledo settlement was flourishing and producing a fair amount of sugar. Now the American settlers are gradually returning to the States, the coastwise traffic is all centred in Belize, and Punta Gorda has the air of a place whose day is past. It consists of two long straggling streets running parallel with the shore. Facing the sea are two or three stores, the Government offices, the D.C.'s and Doctor's houses, and the Jesuit mission. Behind this a grass-grown track runs between rows of small and decaying native houses. The population is mainly Carib, with a small Spanish element.

Making Punta Gorda my base, I now devoted my attention to those rivers which are navigable by canoe. The first to be traversed was the Moho, which reaches the sea about 7 miles south of Punta Gorda. I was fortunate in securing the use of the Government motor launch, in which we could get nearly 20 miles upstream. My gear was then transferred to a canoe which we had towed round, and we proceeded upstream by

pole and paddle. My Carib crew proved themselves far more accomplished watermen than the Indians, since they are essentially a race of fishermen. The " dori "—a long dugout canoe—was managed by two paddlemen, one amidships and one in the stern, and a man with a pole standing in the bows. It was this man's duty to keep the boat's head to the channel in broken water and stave off from rocks and snags when shooting rapids, a task often demanding considerable skill. But the true genius of these people is apparent in their handling of their doris at sea. These, no larger than the one I used, constantly make the passage from Belize to Truxillo or Tela in Spanish Honduras, and are often four or five days out of sight of land, in water where a short choppy sea is liable to spring up almost without warning. And yet, with no navigating instruments at all, they made their landfalls with as much accuracy as the United Fruit Company's steamers.

We reached the limit of canoe navigation on the Moho, only a few miles from Aguacate, on the evening of May 8. An astronomical fixing was made, and the next day we moved down to the junction of the Rio Blanco with the Moho. Here I established a camp in a deserted mahogany barquedier. Several of the huts were still habitable after a year's growth of grass and low bush had been cleared away, and with the advance of the season it was becoming increasingly necessary to have an adequate roof over one's head. I was able from here to get up to the Rio Blanco to the point where I crossed it between Aguacate and San Antonio, thus connecting up the river traverses with previous work.

On May 12 I returned to Punta Gorda, and three days later started on my final trip up Golden Stream, a river some 8 miles north of Punta Gorda. Here we passed entirely away from all human habitation. All the mahogany in this district was worked out some years ago, and it has now reverted to the unbroken solitude of the forest. We met only one native hunter in the river, gaining a livelihood from skins and by marking down mahogany. During the week I spent in Golden Stream we had only one night upon which astronomical observations were at all possible, while there were constant thunderstorms and every sign that the rains were about to break. I therefore decided on returning to Punta Gorda, that very little more in the way of survey work could be done, and that it was advisable to return home. So on May 24 I embarked on the small auxiliary schooner *S.A. Albert* for Puerto Barrios. From here one of the many " gasolinas " plying along the coast took me to Tela in Spanish Honduras, where I caught an Elder & Fyffe's boat for Liverpool.

Historical Note on the above paper

When the British Museum took over responsibility for study of the Maya remains in British Honduras, on which a good deal of preliminary work had been done by Dr. Gann, Mr. Mitchell-Hedges, and Lady Richmond Brown, the Society was asked whether it could support the expedition in any way, and since the country in which the ruins of Lubaantun stand was unsurveyed, it

was decided to propose to the Director of the British Museum that a geographical surveyor should be attached to the expedition at the expense of the Society. When this proposal was accepted, Mr. Geoffrey Laws, who since taking his degree in geography at Cambridge had been for three years on the staff of the Nigerian Surveys, was selected for the work. Mr. Laws on his return at the end of June worked up his map at the Society and wrote a very interesting report, but has accepted a new position in Nigeria and left for that country in September. Major Cooper Clark, who has devoted much of his time for the last twenty years to the study of Mayan archæology, was second in command of the British Museum Expedition, and largely responsible for the work of this season. He very kindly undertook to present to the Society Mr. Geoffrey Laws' report on the geography, and to tell something of the great archæological interest of the site.

DISCUSSION

Before the paper the PRESIDENT (Colonel Sir CHARLES CLOSE) said: To-night we are to listen to a paper by Mr. Geoffrey Laws, read by Major J. Cooper Clark, who we hope will add some material of his own. The subject is the expedition sent out to British Honduras to deal with the site called Lubaantun: it was under the charge of Captain T. A. Joyce of the British Museum. We are not, most of us, very familiar with British Honduras, and I have recently had occasion to know that when the lecture was announced with the simple title "Lubaantun," some of the Fellows did not know where Lubaantun was; one assured me that it was in Tibet, and others expressed doubts if there were such a place at all. We shall hear from Major Cooper Clark about it, and from Mr. Laws' observations where it is within a few seconds of arc.

Major J. COOPER CLARK *then read the paper by Mr. Laws printed above, and added the following account of the excavations:* On the morning of 19 March 1927 Captain Joyce and I left Punta Gorda on horseback with a guide and transport animals, taking the trail already described by Mr. Laws to San Pedro Colombia; and after a brief halt at a narrow wooden bridge we reached Lubaantun at 5 p.m. The following day being Sunday was observed as a day of rest. Messrs. Thompson and Hannay were already installed in the ruins in a spacious hut erected in Court 6 on the fringe of the forest, and near the stream which runs along the foot of the western slope of the spur. They had cleared the whole area of last year's growth. The references are to the plan in Mr. Joyce's report (*Journal of the Royal Anthropological Institute*, vol 56, Pt 2, July–December 1926). Mr. Thompson excavated at Mound S and found a narrow stairway leading down eastward, and when Captain Joyce and I arrived he was working on the megalithic terrace.

On Monday March 21 excavations were begun on Mound D, and what is known as the F and G complex. After the débris had been cleared from F, on the eastern side, a number of complex buildings were revealed which cannot be plotted according to their successive stages of construction until further excavations are undertaken; but there appear to be at least five, if not more, stages.

At the south-east corner of F there is a stairway built on to another, and the latter on to a still older stairway. In the G complex, after breaking through an outer terrace which was boldly done by Mr. Thompson after discovering a small fragment of a stucco glyph on a building running at right angles, a stucco staircase was disclosed running east and west. Six broad steps, decreasing in size of tread as they rise, lead on to a 27-feet platform having a low 2-feet altar,

9 feet broad. Steps, platform and altar are overlaid with thick stucco and finely polished. The stairway descends again on the west, but owing to the overhanging west wall further excavation was difficult for the present.

Mound D had been cleared of débris on all sides and a fairly accurate ground-plan made. It consists of a square building 77 feet on each side, constructed in the recessed perpendicular style with a rise of 2 feet and a recess of 4 inches. The first side of the mound to be uncovered was the south.

The great difficulty we experienced there was to know what to do with the débris. These walls, when exposed, had to be propped up with beams in case of collapse caused by loosening of masonry, of tree roots and interior pressure. The south wall is built over the earlier terrace running north-west and is much older.

The south-west corner, the only one left standing, is well preserved and shows the lowest course to have two layers of stones, the second three, the next four, and so on, the height of the course being the same in each case. Near this corner on the south side a large sileon tree fell the previous year; it was set fire to and took ten days to cool down, and it was noticed that in the process of burning out, sand-flies were particularly troublesome in the vicinity. One of the greatest pests were sand-flies; we had no mosquitoes at all.

The west side of Mound D revealed three stairways: one large and well proportioned in the centre; two smaller and steeper ones on either side. As the ground sloped westward a platform was built up to correspond with the eastern level. The only tree spared on this side was the "poom," from which the Indians extract a particular copal or incense used in their agricultural ceremonies. It differs from ecclesiastical incense, which comes from the "na-bá" tree.

No trace of a stairway was found on the north side, but several built-on altars, a small one near the north-east corner containing upwards of forty shelves, presumably for food offerings. As we worked eastward we found the wall more and more damaged, so that when we reached the north-east corner only one course remained.

The whole of the eastern side of Mound D is so much encumbered with fallen débris that at first sight it appeared to have the stairway the whole 77 feet of its length. It was actually not so. A central stairway measuring only 29 feet 4 inches was found, and this corresponds in length to the central stairway on the west or opposite side.

On the top of the mound a trench was dug from the centre of E, and below what seemed to be the floor were huge uncut blocks of dazzling white limestone, some too large for one Indian to handle. These being removed, a fine stucco staircase similar to the one in G complex came to light, also running east and west, and when part of the outside stairway was removed two more fine stucco-covered steps were found. The recessed perpendicular wall was left standing.

So far only two graves have been found on the top of this mound, and the finds from the various excavations consist of quantities of broken pottery, alabaster and obsidian blades, spear-heads, broken figurines, grindstones and grinders for maize, bone rattles, teeth drilled for turquoise settings, and other objects, and in a grave a number of fine jadite ornaments—ear-rings, beads, pendants, etc.; these last found only two days before we closed down for the season. The Indians were given five or ten cents according to the find.

We left the ruins on May 3 at 6 a.m., and after a halt of twenty minutes at Palmas, reached Jacinto Creek at 3.20; there we transhipped to the launch *Lorette* and cleared the bar on the Rio Grande at 5.45 and made Punta Gorda at 6.30 p.m. I mention these figures because I think it must almost constitute a record passage.

The PRESIDENT: We are fortunate in having with us Sir Frederic Kenyon, Director of the British Museum. We shall be glad if he will say a few words as to the expedition for which the Museum was responsible.

Sir FREDERIC KENYON: You will have gathered from Mr. Laws and Major Cooper Clark something of the general character of the expedition and its double object, which was partly geographical, partly archæological. In its origin it was archæological. That is, the British Museum had the opportunity of sending out an expedition to investigate something of the archæology of British Honduras, and the Royal Geographical Society took the opportunity of sending Mr. Laws attached to the expedition to make such geographical exploration as was possible. That was, I think, mutually advantageous. It was helpful to our party to have Mr. Laws with it. He fixed the position of Lubaantun and, I hope, has established in your minds the fact that it does really exist, and he was also able to contribute something to geography of the surrounding country.

I am not a geographer, and I am not prepared to comment on that part of the paper. There is one part of it which touched upon a subject which has always interested and puzzled me in connection with British Honduras and all this part of Central America, namely, the problem of how those immense works of which we saw the débris in Major Cooper Clark's photographs, came to be produced in a country which, as you are told, is now almost without population. Well, Mr. Laws told us that the conditions of climate are eminently suitable to fertility. Then he went on to explain how nearly every industry in the neighbourhood is a perishing and declining industry, and he suggests that there is not much prospect of its renovation in these times. That tells us, at any rate, that it was possible for the population to be maintained in a country of such fertility, a population which might have built those vast buildings; but it leaves the question to be settled, not so much, I suppose, by geography as by history, as to how the population disappeared and when.

I do not know whether you have grasped from the plans and the photographs what the general lie of the land is. It is a spur of ground with two streams running down on either side to a point, and the whole of that spur has been terraced and built over, so that there are a number of courts and terraces, pyramids, and buildings of various shapes and kinds. As Major Clark says, the evidence goes to show several different periods of building. How far back it goes we cannot tell until excavations have been carried still further. At any rate we gather that over a period which must presumably have been of several generations, building was going on. What they were for we do not yet know.

Then there is another problem. In these buildings, as far as we have gone at present, there is practically no sculpture. On the other hand, the other Maya sites which are known, north, west, and south of it, are marked by very remarkable sculpture. If any of you have been at the British Museum within these last few years you may have seen large casts of a column standing outside the Museum under the colonnade, while in one of the rooms upstairs there are a number of other casts of Maya sculpture. We do not know at present how the buildings at Lubaantun fit in with those other Maya buildings. This site will have to be more fully excavated and explored and, possibly, other sites investigated, until one can get some idea as to how these different phases of Maya civilization fit together and, if possible, what their chronological sequence is and to what dates they are to be referred. Thus you see there is still plenty to be done.

I should like to refer to another feature of this expedition which I think

deserves emphasis. This expedition was an attempt on the part of this country to help a British colony to investigate its own past history. It seems to me that this is a duty which lies upon the country in one form or another, not only in British Honduras but elsewhere. There are parts of the world in which we have special political responsibilities, and it is important, it seems to me, for the credit of this country as a civilizing agency and as civilized people, that we should show that we are interested in the history, the antiquities, the archæology of these various countries. Hitherto that has been left mainly, almost wholly, to private initiative. It is not the tradition in this country for the Government to take the lead in archæological investigations. Here that has been entirely left to private enterprise focussed more or less in societies such as yours, or the British Museum, or various other bodies—the Egypt Exploration Society, the Palestine Exploration Fund, and others, which have been dependent almost wholly on private benefactions.

The Trustees of the British Museum have for a long time past done what they could to help the work forward. They were responsible in the early days for work in Mesopotamia by Layard, Rawlinson, and others, for work in Asia Minor and Cyprus ; they are now responsible for work in Southern Mesopotamia and in British Honduras. In every case they have had to rely on assistance from generous individuals. I want to make it plain that although the expedition about which you have heard this evening was called the British Museum Expedition, the credit of it does not rest wholly with the Museum but with various individuals who made it possible.

In the old days in Assyria the *Daily Telegraph* contributed very largely to the investigations ; in our expedition to Carchemish before the war a large part of the cost was borne by a private individual, then anonymous, now known as Mr. Walter Morrison, who gave a large sum of money to make that investigation possible. In 'Iraq now, though the British Museum finds a portion of the sum, a very considerable part has been contributed by private individuals, among whom I may perhaps specially mention a name very well known to you in this Society—Miss Gertrude Bell. She left a bequest for carrying on this work. In the case of the expedition to British Honduras the funds which the British Museum have used are private, coming almost wholly out of a gift which was made to the Museum during the war by an American citizen, a certain Mr. Roebling, who in order to show his sympathy with this country before his own country had come into the war gave the equivalent of £1000 to the British Museum to be spent at the discretion of the Trustees. It seemed best to preserve that sum for one object which might be especially connected with Mr. Roebling's name. When the opportunity of work in British Honduras came along it seemed appropriate that the gift of this American citizen should be devoted to exploration in the Continent of America. The money provided by Mr. Roebling has been augmented by private gifts from Lady Richmond Brown and many others, which made the two expeditions of Mr. Joyce possible. Last year the Council of the colony of British Honduras voted a sum of money to assist the excavations and expressed the hope that it would be able to go on doing do, so that they, at any rate, are taking an interest in the work and have assisted it to their full capacity. We all owe our thanks to the Council of the colony and especially to the Governor, Sir John Burdon.

I just want to leave that point in your minds : that this work is a means by which we help a colony to investigate its own history, and while I commend the work to your interest and sympathy I should like, on my own account, to express gratitude to Mr. Joyce, Major Cooper Clark, and their colleagues for

the work they have done, and our hope that it will be made possible for them to continue these explorations and to clear up the doubtful points remaining in the archæology of the Maya country.

Mr. MAUDSLAY: It is a good many years since I have been in that country, but I know enough of the difficulties the explorers have had to contend with to appreciate fully the work they have accomplished.

It is a most curious fact that no sculpture or inscriptions have been met with on the site of Lubaantun. It is about 50 miles as the crow flies from Quirigua and within 100 miles of Copan and Tikal, where are some of the finest examples of Maya art, and some are even closer, as at Ixkun. Of course, Lubaantun may be earlier, before sculpture was developed, or it may be later, when sculpture had given way to fresco painting, which owing to damp and vegetation has totally disappeared; but it seems more probable that we have to deal with the remains of another branch or an earlier race of the Mayas. I am inclined to think an earlier race, for at Ixkun I found a very remarkable monument, on it were two elaborately dressed Maya chieftains standing face to face, and they were standing above two roped figures, evidently prisoners, of a completely different physiognomy from the Mayas, and this race may have been the builders of Lubaantun.

I think something may be learnt from a study of the ground plans and orientation of the mounds at the various sites. Lubaantun seems to be more like Monte Alban, in Oaxaca, and the large group of mounds just outside Guatemala City where the stone carvings which have been found of two figures, crude in the extreme, but resembling in appearance the captives at Ixkun.

It is possible that Lubaantun was known to the Spaniards in early days. I was in Seville over forty years ago, and my friend Dr. Marimon, who was working in the Archives there, came to me one day and said, "I came across a curious document this morning; it is a record of services and a request for reward by a Spaniard who says he discovered and captured from the Indians a great walled city to the north of the river Sarstoon." Marimon said it must be a fraud; we know that there can be no walled city in that district, and the petitioner probably relied on the authorities in Spain knowing nothing of the locality.

However, it is possible that the Spaniard reached Lubaantun, and that there may have been Indians there is quite probable, for we know they still pay some reverence to the old sites, and I have myself found pots, with recently burnt incense, in front of some of the sculptured figures in the ruins of Menché on the Usumacinta, evidently placed there by the wild Lacandones; and the Spaniard probably made the most of his exploit. Cortés must have passed not far from Lubaantun on his wonderful march from Mexico to Honduras, for he crossed the frontier of British Honduras near the source of the Rio Grande on his way to the mouth of the Rio Dulce, and as he and his followers were in a state of starvation and were hunting in all directions for food he must have hit on any tracks leading to Lubaantun, if it were still inhabited, but he found the country wild and almost uninhabited.

I see that the canoemen and porters employed were so-called Caribs. I often asked who the Caribs were, and the answer I usually received was that they were just Caribs. They are undoubtedly negroid and not Indian, though on further inquiry I was told that they were Negroes who had been taken to St. Vincent, where they had mixed with the Carib Indians, and had then been moved to British Honduras. This does not sound very plausible. I could not tell the difference by appearance between a Carib man and a Creole negro,

but I could almost always tell the difference between a Carib woman and a Creole negress, and I was told that no Carib woman was ever known to marry or bear children to a Creole negro, and I noticed that when a Carib boat came in with fish no one was allowed to buy until all the Caribs were satisfied. The two African races seem to keep apart.

The Creole negro is often a blue-water sailor and the Caribs are essentially fishermen and coasters. I have sometimes thought that these so-called Caribs may have been cargoes of slaves brought from the great rivers or lakes in the interior of Africa, and a distinct race from the coast negroes who formed the majority of the cargoes during the slave trade, and that that may account for their coastal habits. It is worth investigation.

I see from Mr. Laws' report that he was held up and not allowed to take observations on one of his excursions, as the Alcalde of the village said he was in Guatemala territory. This question of the boundary-line was long in dispute, but was settled, I believe, about 1859–1860 by my old friend Sir Charles Wyke, who was then British Minister in Guatemala, and who negotiated a treaty by which Guatemala agreed to the river Sarstoon as the boundary as far as the rapids of Gracias a Dios, whence it was to run in a straight line to Garbutts Falls on the Belize River, on condition that we established those points and surveyed a cart road from Ysabel on the Golfo Dulce to Guatemala City, England to pay £100,000 toward the making of the road. A party of Royal Engineers was sent out, who established the points on the river Sarstoon and at Garbutts Falls, and surveyed the road to Guatemala City. Then Guatemala asked for the £100,000. We said, "Where is the road?" I believe it was finally arranged that we should pay down £10,000 as each section of the road was completed; but the road was never even begun, and was no more than a rough mule track when I last rode over it. However, we had established our boundary. But this is now all ancient history, as there is now a railroad to the city from the Atlantic coast. However, from Mr. Laws' experience it seems as if the western boundary-line has never been marked, which is not to be wondered at as much of the country it runs through is uninhabited and unexplored. So we see that there are interesting matters, geographical, ethnographical, and archæological, which need attention in the colony of British Honduras, and I hope another expedition to Lubaantun may be organized and that the R.G.S. will be able to support it.

The CHAIRMAN: I think most of us realized in the course of the papers and the discussion that followed that we have heard an account of an expedition of an admirable kind, largely financed by an American citizen. We are indebted to Mr. Geoffrey Laws, the writer of the paper, who was in charge of the surveying operations, and the Society is very satisfied with the result of the expedition from a geographical point of view. I ought to add that the Society paid for the expense of that side of the expedition, with the concurrence and approval of Sir Frederic Kenyon. We are all very much indebted to Major Cooper Clark not only for reading Mr. Laws' paper, but for the admirable photographs and the descriptions which he added, and I thank him, on your behalf, and on behalf of the Society, for that and for his own contribution.

JOHORE IN 1926: *A paper read at the Meeting of the Society, 19 December 1927, by*

CAPTAIN S. W. KIRBY, R.E.

IN the summer of 1923 I was placed in command of a Colonial Survey Section consisting of two officers and five N.C.O.'s and proceeded to Johore with orders to construct a topographical map of South Johore. I was engaged in this work for three years, and during that time travelled on foot, by car and train, or flew in a seaplane over the greater part of Johore with the exception of the north-west corner.

Johore, which lies at the foot of the Malay Peninsula between the island of Singapore, which it flanks on both sides, and the Federated Malay States, is one of the unfederated Malay States. To appreciate the political position of Johore it is necessary to follow more or less the history of the Malay peninsula for the last few centuries.

Early in the sixteenth century the whole peninsula south of the Dindings formed part of the Sultanate of Malacca, which also included many of the islands farther south. The power of this Sultanate was already on the decline when the Portuguese drove Sultan Ahmed out of Malacca in 1511. He fled to Johore, and finally to the island of Lingga.

The Temenggongs or rulers of the various states which formed this Sultanate, on the decline of the Sultan's power, became virtually independent, and the peninsula was split up into various Malay states of which the largest and most important was Johore, which included the area now known as Negri-Sembilan, Singapore island, and some of the islands farther south.

Thus in the seventeenth century Johore is found taking a prominent part in the long struggle between the Dutch and Portuguese for Malacca; but as a result of this interference Johore in the eighteenth century lost her hold on Negri-Sembilan and was despoiled by the Dutch of all her islands excepting Singapore. In 1819 the Temenggong of Johore ceded a trading station on Singapore island to Great Britain, and the whole island was ceded by the treaty of 1824. Johore was then confined to the mainland and her existing boundaries.

During the nineteenth century Johore has been ably governed by her rulers, and her relations with Great Britain have been cordial and intimate. In 1855 Great Britain, in the interest of good order, decided to break what remained of the old ties between Johore and the Sultanate of Lingga, and arranged that the absolute sovereignty of Johore should be invested in the Temenggong and his family, who took the title of Maharaja. In 1885 a treaty was made with Johore recognizing the assumption of the title of "Sultan" by the Maharaja, and promising qualified British protection. In 1910 the Sultan asked for a general Adviser and the loan of British officials to reorganize his government departments.

Looking east from Pulai

Looking south from Pulai

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Malay house, Johore river

The coast at Mersing

Blumit from Bukit Tinggi

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During the same period British policy towards the other Malay states had been one of non-interference with the politics of the hinterland, provided that the peace and prosperity of the Strait Settlements was not threatened. The inability of the rulers of Perak to control the strife between the rival gangs of Chinese for possession of the tin mines, and the feuds between the many petty Malay rulers in the other states, caused such widespread piracy and misrule that the trade of Penang and the Dindings was seriously threatened. Thus Great Britain was forced successively to interfere with the politics of Perak, Selangor, Negri Sembilan, and Pahang, in each case appointing a resident and taking control of the administration of these states. This led to peace and prosperity for these four states, and eventually, in 1895, to their federation, with a central government situated at Kuala Lumpur.

This short history explains why Johore, in whose internal affairs Great Britain was never called upon to interfere, is in the position of an unfederated Malay State, and the British Adviser is there by virtue of a definite request from the native rulers of the country.

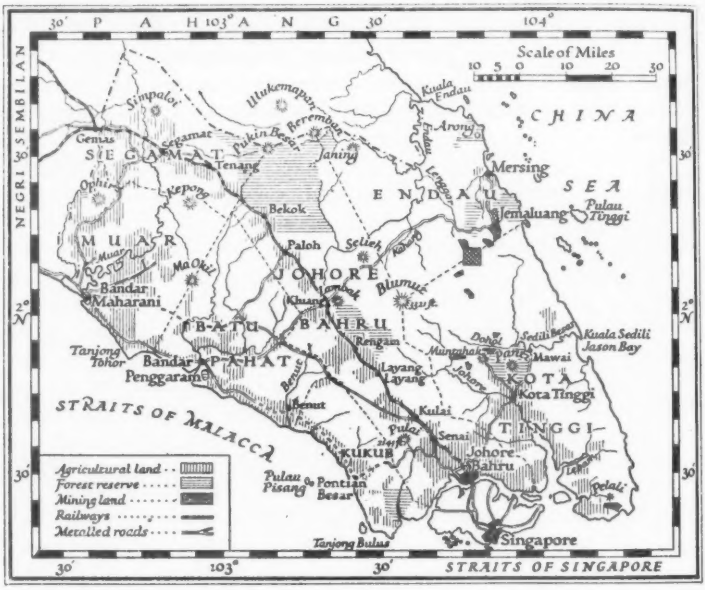
Johore is the only Malay State which has coasts both on the China Sea and the Straits of Malacca. Its physical geography differs from that of the Federated Malay States, which, speaking generally, consist of a backbone of mountain ranges in echelon one behind the other running at a slight angle to the axis of the peninsula, and flanked on each side by an alluvial plain. These mountains cease however on the northern borders of Johore as a connected chain, and appear in isolated masses only. The most important of these are Mount Ophir, 4137 feet, near Muar; Blumut, 3321 feet, in the centre of Johore; Muntahak, 2082 feet, near Kota Tinggi; and Gunong Pulai in the south-west corner, 2141 feet.

Of these the most interesting are Blumut and Gunong Pulai. "*Blumut*," which is a corruption of the Malay word Berlumut, meaning "Mossy," the higher slopes being moss-covered, lies to the east of the railway in the least-known part of Johore. It is difficult of access owing to its position and to the impossibility of obtaining coolies to go near the district, for they believe it is haunted by all kinds of spirits, including the dreaded "Kramat" tiger: it appears that this superstition is due to the fact that the aboriginal inhabitants looked on Blumut as the centre of the universe, and as such the abode of all spirits good and evil.

Blumut is flanked on either side by two smaller hills. The Malays have a legend that Blumut the husband had two wives, one old and ill-favoured, the other young and pretty; in a fit of jealousy the elder wife cut off the younger wife's hair, who in her turn retaliated by a kick (the mark of which is still visible halfway down the slope). To avoid further quarrels Blumut placed himself between the two and has had to remain there ever since.

Gunong Pulai is the largest mountain in south-west Johore, and is the

source of the new water supply of Singapore town. A dam is under construction at the foot of one of the valleys on the south side, and the water is being carried in pipes 3 feet in diameter some 35 miles to Singapore. The work should be completed shortly, and will, I understand, supply the town with over ten million gallons of water daily. Pulai is easily climbed, and as the summit has been cleared for one of the Primary Triangulation points, an excellent view is obtainable from it, the whole of south Johore lying beneath in a huge panorama: to the north and north-east one mass of thick jungle with here and there a patch of bright emerald denoting the presence of cultivated land: to the east and south-east miles upon miles of rubber plantations, broken here



and there by brown splashes showing where jungle has been cleared and burnt. To the south and west a mass of thick jungle terminating in a shimmering silver line, the straits of Malacca, with Pulau Pisang surmounted by its lighthouse standing out in bold relief.

Except for these isolated mountains Johore is generally lowlying and undulating; a hill of 400–600 feet stands up as a marked point in the otherwise rather featureless country. For this reason the rivers, which are numerous, are slow and winding, and often develop into large areas of swamp. They are usually tidal for some distance from their mouths, and are thus edged with a thick belt of mangrove. The formation is chiefly granite overlaid by clay and clay shales and occasional beds of laterite.

There is in common with the rest of Malaya a great difference between the east and west coasts of Johore. The east coast is one long stretch of beautiful sandy bays, broken only by rocky jungle-covered headlands, and the mouths of the comparatively few rivers. This coast is extremely pretty, jungle growing right down to the rocks on the headlands and to the sandy beach in the bays, while in other places the jungle is fringed with casuarina trees and palm groves. The rocks are often red in colour, and the view in many spots is reminiscent of Devon on a sparkling sunny day. There is always a cool breeze, and the sea comes rolling in with foaming breakers except for a short period during the south-west monsoon. During the north-east monsoon, which lasts from November to April, the seas are very rough, and it is impossible to land on this coast except at one of the few ports, and even then with difficulty, for owing to the immense amount of sediment matter brought down by the rivers and the action of the sea in the north-east monsoon, all the rivers have shallow mouths with sand bars, so that even at high tide vessels drawing over 10 to 12 feet of water are unable to enter. The combination of these features has prevented the development of this coast, and it has advanced but little in the last thirty years with the exception of the port of Mersing. The development of this port is entirely due to the building of the east and west road across the country, for it is only by roads that reliable communication with the more populous parts of the country can be obtained, owing to the difficulty of sea transport except for a very short period of the year. Thus on the east coast villages are only found at the mouths of those rivers which give easy communication with the interior, such as the Endau or Sedili Besar, or at Mersing, which has the road. The remainder of the coast is either uninhabited or inhabited by the ubiquitous Chinaman, who makes his livelihood by fishing or growing coconuts and vegetables. He sells his produce at the nearest village, after a weary tramp along the sandy beaches—a very trying method of travelling, as I have found, for the sand is extremely soft and the jungle of the headlands provides an almost impassable barrier every few miles.

Off this coast lie a large number of islands: of these Pulau Tinggi is the most outstanding, being an almost perfect volcanic cone rising to 2000 feet from a base of not much more than 3 square miles. Many of these islands are surrounded by coral reefs and observed from the air have a most interesting and peculiar appearance, the island appearing as the centre of a kind of halo.

The west coast offers a great contrast. It is low-lying and muddy. Often one can travel up to 10 miles from the actual coast before reaching an elevation of 25 feet above mean sea-level. The rivers, which are numerous, are winding and tidal for many miles from their mouth, and are flanked with a thick belt of mangrove swamp: crocodiles abound, and the sea is shallow and muddy for some distance from the actual coast-line. These rivers are navigable for a long way from the coast,

but the tide is very strong and it is difficult to enter the smaller ones against the ebb. Along the whole length of this coast there is a belt of land from 2 to 5 miles in depth which is highly cultivated and thickly inhabited by Malays. The cultivation is in the form of small holdings and chiefly consists of palm groves. Villages are found at the mouths of the larger rivers. This coast is slowly but constantly encroaching on the Straits of Malacca, and villages built near the mouth of the rivers a few years back are now to be found some way inland, the mangrove apparently growing steadily outwards on the mud flats.

My first visit to this coast was with a Government official in a shallow-draft steam launch. We arrived off the river mouth at low tide and had to anchor at least three-quarters of a mile out. A Chinese boatman took us off in a sampan, and toiled for a very long time in a hot sun trying to enter the river against the ebb. At such a time these villages have a very remarkable appearance. The houses are all built precariously on wooden piles driven into the mud, and the piles are seldom cross-braced, so that the whole village gives the impression that it may collapse like a pack of cards. As these piles rot very quickly under the attack of various types of worm, this is actually quite a possibility.

At high tide, of course, the water-level is practically that of the floors of the houses, and one may step direct from one's boat on to the front door of a dwelling-house or the entrance of a shop. A night spent in one of these houses might cure the most active of sleep-walkers, for a false step means either a swiftly flowing river or a drop of 12 feet on to thick mud infested with crocodiles. The side streets are usually formed of duck boarding laid on the mud, and the river is spanned by a curiously built wooden bridge of Chinese origin carrying the old road which runs the whole way down the coast. The whole coast is intersected with small creeks, and the Malay cultivator in his gunwaleless dugout can, at high tide, move quite far inland, collect his produce, and ferry it to the road or to the river.

The south coast is formed by the Straits of Johore, and except for the mangrove swamps at the mouths of the rivers is edged with cultivated land throughout its length. This cultivation is most usually coconut palm plantations, though occasionally rubber comes down to the coast. The Straits are dotted all over with Chinese fishing " pagars," or traps, consisting of rows of stakes placed close together in such a way that the fish swimming against them are guided into a chamber at the head or seaward end. This chamber is so formed that, once in, the fish have little chance of escape. A net covers the bottom. At a suitable moment this net is drawn up by means of pulleys by the fisherman, who usually lives in a little " attap "-roofed shed built over the trap.

With the exception of the coasts which I have described and the banks of the navigable rivers, Johore thirty years ago was almost an unknown

From a water-colour sketch by J. C. T. Willis, R.E.

Malay huts at Gunong Pulai

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From a water-colour sketch by J. C. T. Willis, R.E.

Strait of Johore at low tide

country. To-day roads and railways, although they have led to the development of the country, have done little more than to break it up by narrow strips of cultivation into smaller areas mostly unknown except to the surveyor and the tin prospector. In the north of Johore these areas consist almost entirely of virgin jungle and large swamps, and appear when viewed from the air as one unbroken sea of treetops: movement through such areas is extremely difficult. The interior consists of one dense mass of jungle, so thick and so closely interlaced with thorny creepers that it is almost impossible to move a yard in any direction without previously cutting a rentis, or jungle path. Even travelling by river is difficult, for the river-beds are full of snags and fallen timbers: the smaller streams are generally covered by creepers from bank to bank, and the way has to be cut before a canoe can pass. Although there is no regular rainy season, scarcely a day passes without a heavy downpour, and often a great part of the low-lying country becomes swampy in a very short time. The whole country-side is generally trackless and uninhabited, so that all supplies have to be carried.

In the south of Johore, more especially near the banks of the straits and navigable rivers, this virgin jungle gives way to secondary jungle or "blukar," a much denser growth, and to large areas of lalang grass split up by narrow strips of primary jungle. This gives the country an extraordinary patchy appearance when viewed from the air, an observer often getting the impression that he is flying over English park land, if the lalang areas are large.

It is not surprising that surveying in this type of country is perhaps the most expensive in the world, and the cost appals those who are used to such work in Africa; but it must be remembered that in addition to the difficulties of nature, the surveyor in Malaya has to contend with a very unsatisfactory type of labour in the Malay and the other races inhabiting the peninsula.

However, a topographical map is well worth while in a country of this nature. Take, for instance, the position of the engineer constructing a road: he knows that he has to get from A to B, but of the country in between he is entirely ignorant. It is thus very difficult for him to lay down his road on the best possible lines, and to avoid swampy areas and other natural difficulties which, in a more open country, would have caused him no difficulty whatsoever. It is not exaggerating to say that had a topographical map of Johore been in existence prior to the construction of the existing road system, the trace of the roads would have been very different in many cases, and a great deal of money spent on the construction and upkeep would have been saved.

For the construction of the topographical map we were fortunate in having the assistance of the R.A.F. Speaking from the technical point of view, aircraft in a country of this nature do not provide a great deal of assistance, for, as will have been seen from the illustrations, vegetation

Strait of Johore at low tide. From a water-colour sketch by F. C. T. Willis, R.E.

is so thick that air photographs do not show the ground features and land forms, and thus do not assist the topographer to any great extent. On the other hand, to have aircraft at one's disposal when undertaking a topographical survey of a more or less unknown and undeveloped country is a very great help. One of the greatest difficulties to be faced is the making of plans ahead for the survey of areas the interior of which is more or less unknown. The only methods formerly possible were either to clear hills (useful possibly for future trig. work, no doubt) in order to obtain a view over the forbidden land, or to trek over it on foot, a slow laborious process which often gave little value in return for the energy expended. Nowadays one can sail over it in an aeroplane.

The general lie of the mountains, drainage system, and communications is immediately unfolded to the practised eye of the surveyor, he is enabled to make his plans in advance with accuracy, and thus a great deal of wasted effort is avoided. From the point of view of comfort the aeroplane as a means of transport is ideal. On one occasion I breakfasted in Johore Bahru at an early hour, embarked in a seaplane and flew to Kuala Sedili, walked from the mouth of the river to a hill already cleared and beaconed, observed my angles, and returned by air to Johore Bahru in time for a late tiffin, thus saving 80 miles in a car to and from Mawai, three days at least on the Sedili River in a native canoe, and the expense of the necessary coolies to carry camping equipment, instruments, food, etc. In the future it may be more or less normal for the surveyor to make his reconnaissance or spot a lazy field party from the air, and, fortified by a cocktail, to make up his angle book in the wardroom of one of his Majesty's aircraft carriers ; but this is certainly the first time on record that it has actually been done. The practice is recommended.

During most of the nineteenth century the staple industry of Johore was the cultivation of gambier and pepper. Gambier, which is used chiefly as a tanning material which gives leather a peculiar gloss obtainable in no other way, and as a dye, is obtained from the leaves and twigs of the gambier shrub. These leaves and twigs are boiled together in large cauldrons, and the resulting liquid when strained and stirred sets into a bright yellow, clay-like substance. This substance, cut into cubes, is then exported.

Gambier and pepper were usually grown together, as economies in labour were thereby obtained, for gambier, which comes to maturity quickly and thus gives a quick return on capital, needs a large labour force at stated intervals, whereas pepper, which takes three years to come to maturity, needs continual attention. Unfortunately, gambier exhausts the soil to a special degree. The cultivator as a rule started his garden on the banks of a river and gradually spread inland, planting up new areas every few years and abandoning the old to revert to jungle. As a result large areas of Johore have been cleared, used for gambier cultivation, abandoned, and the soil so exhausted that it will support

only lalang grass and a peculiar form of secondary jungle growth. It is this fact that accounts for the peculiar patchy appearance of South Johore that I have mentioned previously.

It may appear strange that such a wasteful form of cultivation was allowed to continue, but it must be remembered that until the very end of the nineteenth century cultivated rubber was unknown in Malaya, and not only would it have been impossible to keep the pepper industry alive without the gambier, but both provided the State at that period with the major part of its revenue. With the introduction of rubber, the cultivation of gambier rapidly declined. The exports, which in 1890 amounted to some 22,000 tons, fell in 1910 to 13,000 tons, and in 1925 to 1600 tons. During the same period, rubber exports have risen from quite small figures in 1910 to some 40,000 tons in 1926.

At the moment about 70 per cent. of the cultivated land is under rubber, and this area rapidly increases whenever there is a boom. In 1925, during the last boom when rubber reached 4*s*. 6*d*. a pound, large areas of jungle were felled, burnt off, and young rubber planted. For months during that year Johore lay under a pall of smoke due to the extensive burning operations. Rubber in Johore is nearly all in the hands of large companies. Estates owned by British, Americans, Italians, Japanese, and Chinese are to be found along all the main roads and the rivers and railways, and small holdings are not general.

On the other hand, coconut gardens are nearly always owned by native small-holders, and are to be found on the sea-coasts. The native small-holder usually sells his crop of coconuts to a middleman, who gathers them and sells them to the merchant in the nearest town. The cultivation of the African oil palm is on the increase, and I understand several large estates are now being planted in North Johore. Another growing industry is "pineapple canning": this industry, which started to flourish before the war, was nearly killed by the embargo placed by Great Britain on the import of canned pines in the latter part of the war, but it has made a remarkable recovery, and Chinese-owned canning factories are springing up all over the country like mushrooms. The Chinaman is always the first in the field if any money is to be made.

The pineapple is generally grown in conjunction with rubber, for the latter takes some seven years to come to maturity, whereas the pineapple takes only a few months; it is thus often used as a cover crop to protect the soil from the heavy rains until such time as the rubber-trees themselves give the necessary protection, and it is planted on the newly cleared jungle land at the same time as the young rubber trees. The tinning factories are always built on the banks of rivers, for the river not only offers the cheapest means of transport, but is most useful for dumping the refuse from the factory; in fact, travelling up-wind one knows many miles before one reaches it the presence of a pineapple factory.

Both tin and iron are mined in Johore. Tin is found in an alluvial

form near Jemaluang and near the Johore river, but the deposits are small and show signs of becoming worked out, the production of tin, which totalled 3300 tons in 1916, having fallen to only 1400 tons in 1924. There is one iron mine in the country near Batu Pahat producing some quarter of a million tons of hæmatite ore annually; this mine is in the hands of the Japanese.

With the increase of alienation of land for agriculture it was considered advisable to put aside areas for forest reserves, so as to conserve the valuable timbers and other products of the jungle. These forest reserves act as an insurance against future development and preserve the wealth of the forests for future generations. They are situated where the best timber is to be found, and as the development of the country goes on the number of areas put under forest reserve will increase.

It will thus be seen from this very short account of Johore products, that the chief exports are rubber (some 75 per cent. of the total), copra, pineapple, resins, timber, gutta percha, tin, and iron. The chief imports are rice from Siam (rice is the staple food of the native and is scarcely grown in Johore), opium from China, and tobacco from the Dutch East Indies.

It will be seen on any map which distinguishes between cultivated and jungle areas that in Johore the development of the country has followed closely the communications. Cultivation is found on the sea-coasts, river-banks, in a belt along both sides of the railway, and along the roads within economic distance of the railway or a port. The increased use of motor transport is extending this economic distance, and it will not be long before all profitable ground on either side of the existing roads will be taken up for cultivation. Thus it is of interest to consider the present system of communications and the policy for their future extension.

Until quite recent years Johore depended for her communications on the sea and the many rivers and streams navigable to the native canoe, with which she is well supplied. It was in the closing years of the nineteenth century that the Government of Johore, realizing that the future development of the country depended almost entirely on the construction of artificial communications, agreed to the construction of a railway from Gemas on the borders of Negri-Sembilan to Johore Bahru, and started building roads from Johore Bahru radiating outwards to Kota Tinggi and Mawai on the north-east or Gunong Pulai to the west. The railway was completed in 1909, and it was from this period that the present development of Johore dates. To-day the road system has been greatly extended, and Johore possesses some 600 miles of roads fit for motor traffic.

The most important road is that which starting at Johore Bahru runs roughly parallel with the railway to Bandar-Penggaram (Batu Pahat) and Bandar Maharani (Muar), and then on to Malacca and the Federated

Malay States: at both these towns there are no bridges over the rivers and traffic is transported by motor ferries, usually greatly overworked and consequently a source of delay. Branches from this road strike the railway at Renggam, Kluang, Pulai, and Segamat. At the present moment a bye-pass cutting out Batu Pahat is in course of construction, to allow the traveller to reach Muar without having to cross the ferry.

From a point some 10 miles from Johore Bahru a new road branches off, and passing Gunong Pulai on the south strikes the west coast at Pontian Besar, and then runs along the coast to Batu Pahat *via* Benut. At present it is metalled only for some 10 miles beyond Gunong Pulai and southwards from Batu Pahat, the intervening portion being the old bullock-cart track which has been in existence for many years. This portion is simply a mud track, wide enough to take bullock-carts, constructed on a foundation of palm trees and branches of mangrove. In wet weather the bullocks sink in at least 1 foot to 18 inches at every step, and the road becomes an impassable quagmire. With a little spell of dry fine weather the road hardens into the most nobbly and bumpy earth road one can imagine. A 10-mile walk along such a road will produce blisters on the hardiest campaigner, and a shower of rain renders it the most slippery surface that I have tried to walk on: an ice rink is child's play compared with it.

The remaining road, from Kluang on the railway to Mersing, on the east coast is of interest, as it is the only road in Johore which is not at present flanked by cultivation throughout the greater portion of its length, and passes through the real virgin jungle in the heart of the country. For the first few miles after leaving Kluang the road passes rubber estates and newly cleared land, and it is not until the tenth mile that it plunges into really virgin jungle. For the next 40 miles it passes between walls of jungle some 150 feet high set back some 30 feet from the roadway by a belt of land that is kept cleared. Occasionally glimpses into the depths are obtained where the roadmakers have driven bullock-carts in to fell trees for bridge building. At other times it shows but as a forbidding wall. Nothing but the white ribbon of road which unfolds itself in front is ever seen. The sameness of the view and the heat tend to send the driver to sleep, but fortunately the journey is broken more or less by the few huts spaced every 7 to 10 miles by the P.W.D. to house the labour employed on the upkeep of the road. The Kahang River is crossed about halfway along this stretch. At this point it is possible to embark in a dugout canoe and travel direct by river to Kuala Endau in the space of a couple of days if the water in the river is not too low. About the fiftieth mile the road suddenly emerges from the jungle on to a large clear space with very little vegetation, and therefore dazzling brightness, a great contrast to the green of the jungle. This clearing is the tin-mining area of Jemaluang, the tin-mining centre of Johore. The tin is alluvial and the workings all on the surface. The village of this

name is purely Chinese and consists of one long street. The houses are constructed of brick or wood on concrete foundations with corrugated iron roofs, in contrast to the usual attap-roofed Malay huts. At each end of the street is placed the frame of a London street lamp ; it is never lit (indeed, it has nothing inside it that can be lit). The village is remarkable for the fact that the vast majority of the shops are either barbers or agents for Ford cars ; in fact, a dozen Ford cars complete could probably be constructed from the spare parts stocked. The saying of making a living by taking in each other's washing is here superseded by that of cutting each other's hair. Unfortunately, some eighteen months ago a fire consumed the whole of the village, including the street lamps.

From a casual glance it appeared that the mines are worked entirely by female labour. The roads to and from the workings are thronged with women and girls all dressed in blue trousers with red shawls round their shoulders, wearing large hats shaped rather like electric light shades, and combining the functions of umbrella, sunshade, and hat, and carrying their large metal washing-pans. Men are seldom seen except at their ease in the barber's shop or at work repairing the many ricketty Fords along the village street. There are so many Ford taxis competing for the traffic on this road that the whole journey of 65 miles may be undertaken for the small cost of 12 dollars, less than 6*d*. a mile, remarkably cheap with petrol at 2*s*. a gallon. The road crosses the basins of the Kahang and the Lenggor rivers, and thus during the north-east monsoon is very often under water. It is quite usual for the traffic to be interrupted for many days during this season owing to bridges being broken or trees having fallen across the road. Before reaching Mersing, 13 miles farther on, another short belt of jungle is traversed. The last 8 miles, however, run through cultivated rubber estates and coconut plantations. The surface of this road throughout is not bad, but the general lay-out is not of the best. The bridges, which consist usually of wooden planks laid loose on wooden trestles held in position by a rail only, are so constructed that the motorist has to slow up, for taken at speed they have a disastrous effect on springs : thus, even in a powerful car, the 65 miles are scarcely ever done in less than three hours.

Generally speaking the roads throughout Johore are constructed of laterite, which in places is surfaced with tar. Round the towns a crust of granite is being put down, with a tarred laterite surface. When the laterite surface is tarred the roads stand up to the traffic well, otherwise it soon develops potholes if exposed to heavy lorry traffic.

Compared with Malacca, Selangor, and Negri Sembilan the roads of Johore are poor, but they are being improved as rapidly as funds will permit.

The present road policy is to complete the west coast road and the Batu Pahat by-pass, followed by feeders to the railway in north Johore. It is unlikely that any road beyond one projected to run from Johore

Bahru eastwards along the coast of the Straits, will be constructed east of the railway for many years to come.

The capital of the state is Johore-Bahru, which was founded in 1855 by Sultan Abu Bakar, the present Sultan's father. It is on the Straits of Johore, facing the Island of Singapore, and is a most picturesque and busy little town of some 16,000 inhabitants. Until the opening of the Causeway some few years ago it was the terminus of the railway line from the north. This Causeway joins Singapore with the mainland; it is constructed out of granite boulders and is some three-quarters of a mile long and sufficiently broad to take two lines of railway, as well as a road some 24 feet wide.

A hundred years ago all shipping from the Indian Ocean to the China Sea passed through these straits, as the waters to the south of Singapore Island, being dotted with islands, were infested by pirates. Now however the traffic through these straits is confined to a few Chinese tonkangs and the steam launches carrying Government officials on their tours of inspection. For their use the Causeway is pierced at its northern end by a small lock, capable only of taking this type of vessel.

The opening of this Causeway has been a great boon, for it has permitted the running of a through train service from Siam to Singapore without an exceedingly annoying and uneconomic trans-shipment, and has also given a great fillip to the motor industry, as planters from up-country can now deliver their goods direct to the merchant houses in Singapore by road. There is still, of course, a Customs barrier to be passed, and it is a very common sight to see a lorry filled with pineapples being solemnly unloaded by the Customs officials, much to the benefit of youthful observers, in order to find the few sheets of rubber which the owner or probably the driver has been attempting to smuggle out of the country.

The Sultan's official palace the "istana laut" is built on the water-front, as is the Mosque and the new Government offices now in course of construction.

Near the jail at Johore Bahru there are a series of small iron cages standing in the open exposed to sun and rain. I imagined that they were used for animals taken alive in the hope of finding a purchaser in the travelling agent for a zoo or circus. Later I was informed that these cages represented the remains of the old jails. There were cages in which a man could stand just upright. These represented the "second division." The smaller cages in which a man could not stand or lie at full length were reserved for the worse offenders. The prisoners confined in these cages were left to live or die as best they could, their friends and relations feeding them if they thought it worth while. It is, however, many years since these were anything other than an interesting relic of barbarism.

There are only two other towns of any size—Muar (13,000) and Batu

Pahat (6000); both are flourishing commercial towns situated on the west coast, lying on the main road from Singapore to the Federated Malay States, and served by an efficient steamship service. They serve as clearing points for the produce of large inland areas, and at the moment are suffering from a wave of wealth and prosperity due to a large extent to their being centres of the rubber smuggling industry—one of the products of the Stevenson restriction scheme. As an instance of the flourishing condition of this industry it is only necessary to say that not only do the smugglers offer exorbitantly high wages to any one who will run a cargo across to the Dutch East Indies, but also if he is caught will pay a pension to his wife and family for the whole period that he resides in the local jail.

The fauna of Johore, depending on the most luxuriant forest growth, is rich and varied, and includes among others the elephant, rhinoceros, sladang (the Malay Bison), tiger, panther, and deer of various kinds. The larger animals are rarely seen or heard, and, although one frequently comes across their tracks, they are so timid that one seldom meets them. During my three years in the country, a greater portion of which was spent in the jungle, the only animals I saw were snakes; one, a python crossing a river, the other the King Cobra, and that was not in the jungle but in the rough at the eighth hole of a well-known golf links. I have had however a tiger walking round my tent at night, and I heard an elephant pass within a few yards. One member of my section met a tiger face to face in a narrow jungle track; they both stopped and stared at each other for what must have seemed like hours, until the tiger thought better of it and retired by the way he had come.

Game in Johore, with the exception of tiger, is preserved. Game licences can be obtained, but they are not cheap. Big-game shooting requires considerable time; coolies are expensive and inefficient. The intending sportsman should remember that the Malay is no Shikari, and a sportsman who has tracked his quarry for the whole day and made his kill late in the evening must generally be prepared to skin it with his own hands without delay.

The best method of securing a tiger in Johore is to make friends with the manager of a rubber estate when he is suffering from the raids of a man-eater. This may be a serious thing for him, for if a coolie is taken while tapping the whole of the tappers will strike until either the tiger is killed, or a large gang of men are employed beating gongs and blowing trumpets during the whole of the tapping period. Thus the manager is only too glad to find anybody who is prepared to sit up for a tiger, and good sport is sure to be obtained. Should it be known that a man-eater is in the neighbourhood, the Malays, who believe that a man is never taken if he is looking in the direction of the animal, wear, when they are tapping, a mask on the backs of their heads, so that the tiger is led to believe that he is being watched. This is no uncommon trick,

From a water-colour sketch by J. C. T. Willis, R.E.

Chinese shop at Temon

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From a water-colour sketch by J. C. T. Willis, R.E.

The Bar at Kuala Mersing

the British Navy having employed it by painting a bow wave on the stern of a vessel in order to confuse German submarines.

Tiger and crocodile are treated as vermin, and rewards are offered for their capture, dead or alive. A live tiger is worth $125, and dead $75. The digging of pits is not allowed in certain districts, and infringement of this law is punished by a fine of $15. On one occasion a Chinaman was solemnly paid $125 reward for a tiger taken alive less $15 fine for digging the pit in which he trapped it. The police usually cut a circular patch out of the shoulder of the skin in order to prevent a second award being claimed, and it is said that several Chinese shopkeepers have started producing patches to match and fixing them in position. This is surely the most lucrative branch of invisible mending.

The reward for a crocodile is paid by the length of the skin measured along the back, and I have seen the whole of a Malay family having a tug-of-war with a crocodile skin in the hope of receiving an extended reward.

There are many kinds of deer, and these animals are the curse of the rubber planter. They prefer the bark of young rubber trees to any other food, and will go to great lengths to get it. All rubber estates are fenced in, and the fences have to be continually patrolled and repaired. Gaps are sometimes purposely left in these fences, and cunningly concealed pits some 10 feet deep are placed in the gaps, and often the bottom of these pits are filled with pointed stakes. On more than one occasion a member of my section, green to the country, making for the convenient gap, was suddenly engulfed; fortunately however in these cases the pits contained no stakes.

The population of Johore is mixed, consisting of many races, the chief being the Malays native to the country, Malays from the Dutch East Indies, Chinese, and various types of natives from India. At the last census the population of Johore was slightly over 250,000, made up of 158,000 Malays, 97,000 Chinese, and 24,000 Indians. This is an increase of some 100,000 on the figures of the 1911 census. This increase is not due to natural causes, for the death rate exceeds the birth rate annually, but to increased immigration resulting from the prosperity of the rubber industry and in general the great development of the country.

The Malay, the present occupier of Johore, is not however the original inhabitant. These, the Sakai and Jakun, are still to be found, but in very small numbers and only in the central districts of North Johore.

The Malay is an extremely attractive and courteous gentleman. He is sensitive to ridicule and sarcasm, but responds to encouragement and praise, and has a well-developed sense of humour. His chief characteristic, however, in all classes is a disinclination to work. This is probably due to the enervating climate, which is not conducive to physical and mental energy, and to the fact that the soil is so fertile that a minimum of effort is necessary to provide his daily food. The past history of Malaya

The Bar at Kuala Mersing
From a water-colour sketch by F. C. T. Willis, R.E.

shows that the native has learnt by bitter experience that a man who works sufficiently hard to acquire possessions soon has them removed from him by his chief or stronger neighbour. Thus in the course of time he came to realize that it was useless to kick against the pricks, and that industry on his part was not worth while. The Malay is more at home sitting on the verandah of his house, or watching the coconut ripen, or acting as a Durian Jaga or watchman, than undertaking any job that requires a sustained effort or the expenditure of any physical energy.

The Malay is more of a fisherman, or *orang laut*, than jungle man, or *orang hutan*. Every Malay is at home in a canoe, and the bulk of the Malayan population of Johore is to be found on the rivers or the coasts. The Malay always builds his houses off the ground, perched up on wooden piles some 6 feet high. He prefers to live over water rather than over land. This method of building appears most satisfactory, for he thus avoids the attentions of many insects, more especially the white ant, and I suppose he has found by centuries of experience that there are fewer mosquitoes and therefore less sickness amongst those living over running water than amongst those who live inland. In this connection there is a story of a hill which was supposed to be haunted. At one time the village had been built near the top of the hill, but the inhabitants became sick and died off so rapidly that they found it necessary to go and live somewhere else, and so they migrated and built their village at the mouth of the river close to the foot of the hill, and the local legend still believes that the hill was inhabited by evil spirits, and no one will live near it. Modern science discovered, however, that near the foot of the hill there was a great deal of seepage water which the sun was able to reach. This water bred a particularly virulent kind of mosquito, and the mosquito made his way uphill rather than down, so that anybody living above the breeding places was pretty certain to contract malaria.

The Malay has not been behindhand in adopting civilization. He has quickly realized the labour-saving value of motor transport, and the Ford car is now used wherever roads permit. The bullock-cart is relegated to the newly made tracks in estates. He picks up the art of driving a motor car quite quickly, but unfortunately he seems unable to grasp the fact that there is any intermediate speed between full speed and stop, and he seldom understands what goes on underneath the bonnet.

At first I attempted to use Malays recruited from the interior as survey coolies, but soon realized that the Malay's instinctive dislike of routine work and poor physique made him a bad type of coolie for a Topographical Field Party. A Johore Malay has little stamina, and quickly succumbs to exposure, a spell of wet weather usually bringing out the malaria present in every man. His physique is so poor that it is seldom possible to move camp more than 6 to 7 miles a day, even with a prepared rentis or track.

From the Malay's point of view he speedily discovered that the white

man as a surveyor worked harder and faster than the native surveyor, under whom he was used to serve, and, deciding this was not part of his contract, he more often than not absconded. Being a Muhammadan, he keeps his Bulan Puasa, or Month of Fasting, and whether he observed it or not it provided a most excellent excuse for every sort of malingering. Amongst other annoying habits he is extremely improvident, and seems to consider that it is only right for his employer to provide him with large advances of pay at all and every possible occasion, such as religious feasts or domestic afflictions of various kinds. In such circumstances, it is not surprising that I tried to obtain another people to constitute the bulk of my labour force.

The Chinaman is ubiquitous in Johore. He is to be found in every walk of life, from rich merchant to street hawker. His chief *rôle* is, however, that of shopkeeper or coolie. In a grocer's shop you will find the owner and manager, a man probably worth his £1000 a year, carrying the heaviest loads, unloading the lorries, feeding with his coolies, and often indistinguishable from them. A Chinaman in Malaya will attempt anything that has sufficient chance of profit to himself, and is always the pioneer as shopkeeper or speculator in any form of commerce. As a coolie he is an excellent worker if good wages are assured—in fact, he will do anything for money. He is an inveterate gambler, and, as gambling is forbidden by the laws of Johore, he very often finds himself in the hands of the police. As a survey coolie I found he was not of great value. In the first place his language is frankly impossible; if one did manage to get the words it seemed the tone was wrong. Secondly, he is not a jungle man; he requires a more varied diet than most other natives, and therefore is extremely difficult to feed when out on long treks. His method of carrying things is to balance two equal weights on a pole which he places on his shoulder, and he progresses by a sort of shuffling trot or run. He manages to transport great weights by this method. I had hoped that by his use trekking in the jungle would be simplified, but I found that unless he had a smooth wide track his usual method of carrying things was of no use, and, as he had no other ideas, he rather failed me in this respect.

Indian labour is imported under various Government regulations and supervision. The law does not admit transference of coolies between different employers, and it is necessary to provide quarters reaching a definite Government standard. Such labour is largely used on rubber estates. The Tamil makes a very good tapper and labourer in such conditions, and even with the cost of importation this type of labour is often cheaper than the local Chinese or Malayan labour. From my point of view the many regulations, the poor physique of the men, making them useless for jungle work, and the fact that it was necessary to import a percentage of women as well as men made this type of labour impossible for survey purposes.

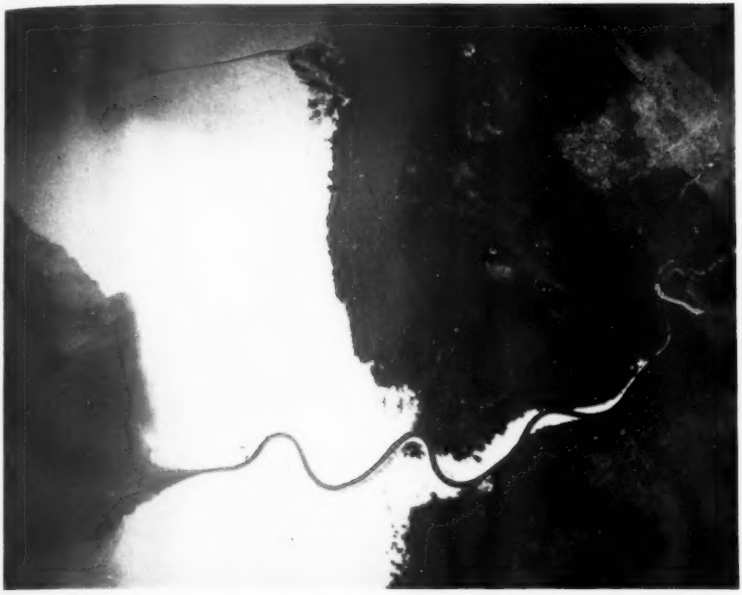
To replace the Malays as coolies I was enabled by a stroke of luck to recruit a party of Dyaks from Sarawak who appeared in Johore Bahru looking for any work which would enable them to avoid falling into their besetting sin of stealing gutta percha from the Government forest reserves. This party, tattooed from head to foot and exuding a noisy geniality over all with whom they came in contact, were taken on with some misgivings. They proved however most excellent coolies. They were good workers, and being born naturalists and jungle men they were far happier in the unexplored regions at work than they were in more civilized places. They carry their loads in ambongs on their backs, and can travel fair distances with a full load along jungle rentis at a speed of some 2 miles per hour.

They were however rather difficult to deal with because they were entirely unaccustomed to the ways of the white man, having probably only encountered a few in their lifetime, and thus there was always a mutual unexpectedness in one's dealings with them. Secondly, they were in no sense " coolies." Their attitude was much more that of an independent colleague, and this fortunately without any lack of respect or willingness. Thus I found they were much more easily dealt with by a combination of humour and firmness than by any other method.

In contrast to the Malay the Dyak lives on the jungle, plus a certain amount of rice. His diet consisted of turtles, pig, monkeys, roots, fruit, soft bark, and other things which he alone knew were edible, all matters of doubt being solved by empirical methods. There was no necessity to carry tents or tarpaulins for them, as they were quite able to produce waterproof shelters out of the jungle itself. Their living expenses were nil, and they thus banked their pay with their employer, so that at the end of their period of work in the country they were enabled to return home to their own country as capitalists. It is not so long ago that the Dyak was a head-hunter, but only on one occasion did any of my Dyak coolies show a tendency to relapse. One was discovered with a newly garnered human head as his pillow. On investigation I am glad to say this head was not taken from a member of the section, but that the coolie had found a dead Chinaman.

In sickness the Dyak proved rather a handful. You gave him medicine, he would not take it but kept it, for it represented capital in his own country. The *leger de main* with which the Dyak could " vanish " a quinine pill would make Messrs. Maskelyne and Devant jealous. It was next to impossible to get him to go into hospital, for, as he says, and quite rightly, so many people go in alive and come out dead ; and in his own case, as he invariably delayed his entrance to the last possible moment, this was unfortunately true.

From an educational point of view the Dyak was prepared to make the fullest use of his opportunities, and on more than one occasion I have known a gang of coolies purchase slates and pencils in a village when



River mouth, west coast of Johore

Headland and sandy bay, east coast of Johore

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Johore Strait, with causeway connecting Johore Bahru and Singapore

Johore Bahru and the causeway from the south

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passing through, and in the evening invade their employer's tent and ask to be taught something: the selection of the subject being left entirely to the employer's good taste. I generally attempted to teach them how to write the numerals, but found that 6 and 9 presented an insurmountable difficulty. I attempted to tell them about London, but I was very quickly told that I was not telling the truth. Even the production of picture postcards merely impressed them with the elaboration of the fake.

In his own country, Sarawak, neither elephants nor tigers are to be found. His first remark on seeing an elephant's footprint was that if they could but secure an animal that size they would have no need to do anything but eat for weeks. However, when they did meet either of these animals they were terrified, and I have never been called a liar so point-blank as when I explained that the despised Indian coolie of no physique rode on one of these animals in his own country controlling its movements. In the Dyaks' eyes this was absolutely incomprehensible.

In conclusion, it may be of interest to compare the development of Johore with that of the Federated Malay States during the last thirty years. Whereas the latter with the assistance of British organization and capital and the growth of the rubber industry developed with great rapidity, Johore remained for some fifteen years, till the completion of the railway in 1909, in a state of development similar to that described by Mr. Lake when reading a paper before this Society in 1894. From 1910 however Johore has made rapid progress, and at the moment from 22 to 25 per cent. of her total area is under cultivation, and it may be anticipated that with the continuance of the present road programmes one may look for rapid development west of the railway. It must be remembered, however, that Johore relies almost entirely on her agricultural resources, having no rich minefields to fall back on, and, as some 75 per cent. of the total cultivated area is under rubber, the financial condition of the country and thus its development is largely bound up with the rubber industry.

DISCUSSION

Before the paper the PRESIDENT (Col. Sir CHARLES CLOSE) said: To-night we are to listen to a paper by Capt. Kirby, who was lately in command of the Colonial Survey Section. That Survey Section was a small body of two officers and a few non-commissioned officers, founded in 1904 by the late Colonel Hills, and was originally sent out to Jamaica. When it reached Jamaica that Government refused to contribute towards it, and so the Survey Section was removed. It was then sent out to what was the Orange River Colony, and remained there over five years. It did an admirable piece of work, and to this day the Orange River Colony, thanks to the labours of the Colonial Survey Section, is the best-mapped portion of South Africa. The Section then went to Sierra Leone, and next came the war. After the war it was revived, but split into two, one portion going to Hong Kong and another to Johore. We are not dealing this evening with the Hong Kong portion. We shall hear, I hope, a good deal, not perhaps of the technical work of the Colonial Survey Section, but of the country in which it has worked. Capt. Kirby commanded this Section for over

three years and was the whole time in Johore, so that he is amply qualified to give us an account of that country.

Capt. Kirby then delivered the lecture printed above, and a discussion followed.

Lieut.-Gen. Sir WEBB GILLMAN: I went out to Singapore last summer on a special mission connected with the naval base which lies between Singapore island and Johore. The naval anchorage was to have included the East and West Straits, but the Causeway has blocked that project. This Causeway has a small lock which is only 30 feet broad, and limits the passing of anything but small vessels. The naval base and anchorage therefore lies to the east of the Causeway, and the problem I was more intimately connected with was the defence of those waters. During my investigations I found that the survey work carried out by the lecturer and his assistants was of the greatest value to me, and it is of equal value to those officers who will be responsible for the land defence of the naval anchorage. The more the country is opened up the greater will be the military responsibilities owing to the increased facilities for the movement of troops.

Speaking from a military point of view, and I feel that I also echo civilian sentiment, the absence of an easily accessible hill station, like Nuwara Eliya in Ceylon, is much felt. Mounts Ophir and Blumut are not high enough or large enough to allow of one getting away into cool air in order to recuperate one's health, which is bound to suffer in these humid districts. The Cameron Highlands are a possibility, but they are a very long way from Singapore.

One of the facts that is not realized by those who have not been in these parts is that there are rather more pests than in West Africa, and if more soldiers are required to defend the naval base it will be necessary to build more barracks, and that means more money not only for barracks but for anti-malarial measures. Another difficulty in this part of the world, especially for the fighting services, is that their pay is calculated at home by the Treasury in pounds less home income tax, and then translated into dollars—a dollar being 2*s.* 4*d.* But as you can only buy a shilling's worth with a dollar, it is very hard for the sailor or soldier to make both ends meet, and I hope that in the future his pay will approximate to the higher standard of the civilian, who is relatively higher paid and is not docked home income tax.

The lecturer very correctly described the method of Chinamen when driving a Ford or other car. There is no need to go to Brooklands for thrills! In the winding road from the Causeway I once just escaped being run into by a Chinaman whose only pace was as usual either full gallop or stop. On this occasion the driver, to avoid me, turned off and ran down the bank into a ditch; he was pretty well shaken, but when we got him up off he went again at full gallop. As the lecturer has pointed out, the Chinese are an extraordinarily hard-working race. They have come into the country because the Malays are entirely the opposite of hard working. Last year 375,000 Chinese came into Singapore; 100,000 went out; and there were a good many already in the country before the last lot came in. In the case of trouble in the future we have to see that internal security is sure, and that the Chinamen who are there are doing something for the good of the country, and not merely finding a haven of refuge while feathering their own nests.

Lieut. J. C. T. WILLIS: It is with some diffidence that I find myself on the platform attempting to add anything to what has been so ably said with regard to Johore, but there is one point which I should like to amplify. Capt. Kirby, when speaking of our labour difficulties, mentioned Dyaks, and on the strength of three years' rather intimate acquaintance with these folk, in the jungle and

more or less under their own conditions, I should like to say a few words to show you what nice people they are to deal with. Short and stocky, clad almost entirely in blue tattoo, they wear their hair right down their backs and appear to have no definite knowledge of the white man beyond what they get from one or two District Officers in the course of their lifetime. When first they came they were full of unexpected surprises. They were in no sense coolies. "Genial survey collaborators" was much more their general outlook. A story may enable you to realize how one had to deal with them and what an attractive mentality they had.

I was walking along a very narrow jungle path. A Chinaman coming in the opposite direction required a great deal more than his fair share of the path. As we brushed past each other, four of my Dyaks pattered up with very broad smiles on their faces and very large knives in their hands and said, "Did you see that man? he did not give you anything like enough room to walk; may we please cut his head off?" I had to act quite quickly, for silence is taken as consent, and it is somewhat awkward to explain afterwards that one did not really mean it.

I left these folk with very genuine regret, and, I may also add, with a certain amount of subterfuge, because six of them, having saved enough money for a journey to Europe and equipped themselves, with a general view of appearing well in London society, with one Homburg hat apiece, announced their intention of coming home with me.

There is only one other point I should like to add, and that is that in the course of our surveys in Johore we encountered many nationalities—British, American, Danish, Italian and Japanese, in addition to the many races who regard Malaya as their rightful home; in every single case we met with the most open-handed hospitality wherever we went. Whatever our difficulties they did their best, whatever their nationality. to alleviate them.

Mr. J. V. MILLS: The only excuse I have for presuming to address you is that I happen recently to have been stationed in Johore for eight months and that I have attempted, without very much success, to write for official purposes an account of Johore in 1926, which is the subject of the lecture to-night. One point of historical interest: the lecturer remarked that the whole of the island of Singapore was ceded in 1819 to Great Britain. As a matter of fact, by that treaty of 1819 only a part of the island was ceded; it was by a subsequent treaty of 1824 that the rest was added, and under the treaty of 1855 all the territorial waters, that is the straits between the island of Singapore and the mainland of Johore, are ceded to Great Britain.

Gunong Pulai is destined to become the main source of water supply for the town of Singapore. The Master-General of the Ordnance was present, I think, in May, when the dam was opened by His Highness the Sultan. That allows 3,000,000 gallons a day to go through to Singapore, but when the work is completed the daily yield will be some 13,000,000 gallons. That may seem a large amount, but Johore will take nearly 1,500,000 gallons, and I understand that about 2,500,000 gallons will be required for the naval base.

There is one peculiar point about the island of Pulau Tinggi off the east coast. Chinese junks have been sailing to these waters for the last thousand years or so, and the Chinese chronicles record that in the year 1403 one Cheng Ho, the well-known ambassador of the then emperor who got as far as East Africa in his travels, called that island by the nickname "Cheong Kwan Mo," and even to this day the island bears this name, which means "General's Hat."

With regard to erosion by the sea, it is most peculiar how within a short

distance, the sea both encroaches and recedes. In 1920 mangroves were growing out to sea at the mouth of the Selangor River where the detritus was deposited, while 10 miles away at a village called Jeran, the sea was encroaching on the land.

The lecturer referred to Chinese pineapple-canning factories and the nuisance they were. Attempts are being made to persuade the people to deal with refuse in a proper manner instead of dumping it on the roadside, and the Agricultural Department is trying to find out whether an economic product cannot be manufactured from what is at present merely waste. The production of tin was artificially stimulated during the war. It was required for war purposes, and special appeals were made to all miners to produce as much as they could. Many lost money in responding to that appeal. The trouble about Johore is that while there is tin, it occurs in isolated patches, and this means uneconomic working.

I rather suspect the lecturer has shown as forest reserves some areas which are not, technically speaking, reserved yet. The process of reserving a piece of forest is somewhat long and complicated. According to my information the amount of forest reserved at present is only about 173 square miles, though it is intended to increase that considerably. The forest survey has not yet been completed, and obviously it is no use reserving forest if the timber is not worth keeping.

There is rather a curious point in connection with the wood and timber trade. Wood and timber appear in the lists both of exports and of imports as one of the most important items. The explanation is that raw material goes to Singapore and is there worked up into planks, etc., and reimported into Johore. The wood and timber business is in the hands of Chinese merchants, who all work in a ring: therefore the price is kept up. The business is not at all well organized, and a forest officer once told me that in Pahang, which is one of the eastern states, he actually found charcoal which had been imported from Sumatra when all around were miles of forest which would produce excellent charcoal.

Henry Ford has been as valuable in Malaya as elsewhere. There is cheap, regular, and rapid communication over all roads by means of Ford cars, one of the advantages of which is that nearly every shopkeeper can put it right if it happens to go wrong. The usual rate for a four-passenger car is 7*d.* per mile, so that you can imagine how cheap transport has benefited the country. Some of the roads are made through mangrove swamps and therefore are continually sinking, and even where surfaces have been tarred potholes are being made by the heavy lorry traffic. That is a serious problem which the state has to face; it may be that solid-tyre lorries will be prohibited altogether.

There are one or two points with regard to smuggling which may interest you. It is quite true that pensions are being paid to the dependants of those who happen to be put into gaol. At first there were many appeals, most of which were unsuccessful, and the unsuccessful appellants who went to gaol told their Chinese employers that it was not good enough. They were given the option of receiving either 200 dollars or appealing. They all received their 200 dollars and went to gaol.

The PRESIDENT: We have had an excellent geographical lecture, and we hope that Capt. Kirby may be able to add, in the account which will be printed in the *Journal*, some of the technical details that many of us would like to read. I am sure we have all listened with real interest to Capt. Kirby's lecture, and that you will show your appreciation of it in the usual way.

NATHANAEL CARPENTER AND ENGLISH GEOGRAPHY IN THE SEVENTEENTH CENTURY

J. N. L. BAKER

IN his Presidential Address to the Geographical Section of the British Association in 1901 Dr. H. R. Mill called attention to the work of Nathanael Carpenter,* "the first British Geographer to write on theoretical geography as distinguished from mathematical treatises on navigation or the repetition of narratives of travel." † Three hundred years have passed since this work was published, and it is not inappropriate to examine it in a little more detail than was possible when Dr. Mill brought it "to the notice of many geographical students for the first time." It is not however the object of this paper to discuss Carpenter's attitude towards the meaning and scope of geography, but rather to deal with the book itself, the sources from which its material was derived, and the influence which it exerted on contemporary and later geographical writings. It is well therefore to state at once that Carpenter was no revolutionary. If he rejected the theory he maintained the form of his predecessors, and is to be compared, not with Munster nor with Cluverius, but with Apianus, Frisius, and Varenius.

Nathanael Carpenter was elected a Fellow of Exeter College, Oxford, in 1607, and there found himself in the company of several geographical scholars. In that year another Exeter man, Robert Stafford, published 'A Geographicall and anthologicall Description of all the Empires and Kingdomes both of Continent and Ilands in this terrestrial globe.' This small pamphlet ran into three editions, the third of which appeared in 1634. Stafford explains in his Preface that "the method I had from my tutor, and so far forth the rest that I account it but the gleanings of his plentifull Harvest." A chance manuscript note on the title-page of the third edition in the Bodleian Library gives the identity of the tutor. It runs: "This booke was for ye most part made by Jo. Prideux Rector of Exon. Coll. and since B[ishop] of Worcester but afterwards published by his scholler Rob. Stafford under his owne name." Prideaux, who succeeded Holland as Rector in 1612, was presumably giving instruction in the subject when Carpenter became a member of the College, and may have assisted in the compilation of "Geography delineated forth in two Bookes." Not only so, but he attracted other geographers to Oxford including D'Orville and Cluverius. The latter, according to

* 'Geographie Delineated Forth in Two Bookes, containing the Sphæricall and Topicall Parts thereof.' Oxford 1625; second edition, corrected, *ibid.* 1635.

† *G.J.* 18, 407, October 1901. As early as 1559 William Cuningham published 'The Cosmographical Glasse, conteinying the pleasant Principles of Cosmographie, Geographie, Hydrographie, or Navigation.' It consists of five books, of which four deal with general principles and the fifth with regional description. Although similar to the standard works of the period and particularly to that of Apianus, it cannot in fairness be ignored.

Wood (' Athenæ Oxonienses,' ed. Bliss, II 335), visited England at the age of twenty-nine and made Oxford his chief place of residence, "particularly in Exeter College, of which he became a sojourner for the sake of Holland and Prideaux in 1609" (O.S.). He is said to have renewed his friendship in later years and "had offers of promotion tender'd unto him," but he returned to Leyden, "the place of his delight," and died there in 1623.* Carpenter makes no reference to the work of Cluverius, but it is not unreasonable to suppose that he knew its author and discussed with him the subject of geography, and it is almost certain that he used it in writing his own book. Another Exeter man, Nathanael Norrington, a Fellow from 1613 to 1630, also appears to have been interested in the subject and to have helped Carpenter. In the words of the latter, "to his learned conference I confesse myself to owe some fruits of my labours in this kinde, and all the offices of friendship" (Carpenter, I 247).

In the larger sphere of the University there were several men from whom Carpenter derived assistance. Among them were Henry Briggs (Professor of Geometry), John Bainbrigge (Professor of Astronomy), and Robert Hues. The copy of the first edition of Carpenter's book in the Bodleian Library was presented by the author to Bainbrigge, and has in it the following inscription: "Clarissimo doctissimo viro D. Johanni Bainbrigge Medicinæ doctori peritissimo ac Astronomiæ in Academia Oxoniensi Professori selectissimo hæc qualiacunque lucubrationum suarum fragmenta in perpetuam amicitiæ tesseram D.D. N.C." Hues spent the closing years of his life in Oxford, and perhaps discussed with Carpenter some of the points raised in his 'Tractatus de Globis.' It is certain that Carpenter used that work, and one may infer from references that he valued it highly; but unfortunately some of the quotations are borrowed from another source, so that an estimate of the real debt of Carpenter is impossible. Hues died in 1632, and so survived Carpenter by four years. His 'Tractatus' was reprinted by the Hakluyt Society in 1889 (First Series, No. 79).

As stated in the title, Carpenter's Geography is divided into two books, the first of which deals entirely with the mathematical aspects of the Earth as a whole. It is very largely borrowed from the writings of others. In addition to the standard mathematical works of the day he made considerable use of those of Apianus and Gemma Frisius.† Throughout the first book he makes frequent references to and quotations from the 'Tractatus' of Hues, and this source, together with Clavius' commentary on Sacro Bosco,‡ provided the greater part of the material for chapter ii,

* J. S. Cluverius, son of the geographer, was one of Prideaux's pupils. Wood, *op. cit.*, II 337; Boase, 'Registrum Collegii Exoniensis,' c.

† Possibly the composite edition of 1584 published at Antwerp under the title 'Cosmographia sive Descriptio Universi Orbis, Petri Apiani et Gemmæ Frisii mathematicorum insignium iam demum integritati suæ restituta.'

‡ 'Christophori Clavii Bambergensis ex Societate Jesu, in Sphæram de Sacro Bosco Commentarius,' 1594. Carpenter made particular use of the chapter "Terram et

"Of the conformity of parts in the Constitution of the Terrestrial Sphere." The two following chapters, dealing respectively with "Partial magneticall affections" and "total motions magneticall," are based largely on the classical work of Gilbert,* "who to his everlasting praise hath troden out a new path to Philosophie and on the loadstone erected a large Trophie" (I 45). Many passages in these chapters are mere translations from Gilbert's book.

A large number of authorities furnish the material for the following chapters dealing with the site, stability, and proportion of the earth in respect of the Heavens (v); circles of the Terrestrial Spheare (vi); the artificiall representation of the Terrestrial Spheare (vii); and the measure of the earth (viii). Among these, as might be expected, the work of Hues takes a prominent place. In chapter vii however the important contribution of Edward Wright is introduced,† the remaining projections being taken from Frisius, to whose 'de Astrolabio' as well as to the work of "Stifelius,‡ but especially Guido Ubaldus,§ who hath copiously and accurately handled this subject," Carpenter refers his readers for more information. Hues may also have supplied part of chapter ix, "of the Zones, Climates, and Parallells," but it is not certain. Although he does not say so, Carpenter has borrowed a great deal, both in this chapter and in those preceding it, from the 'Geography' of Keckerman,‖ referred to elsewhere in his book as "a late German writer."

The remaining part of the First Book is derived largely from Blundeville's 'Exercises,' the sixth edition of which appeared in 1622. The particular exercise which Carpenter used was "A plaine treatise of the first principles of Cosmographie." From it he took "a table of miles answerable to one degree of every several latitude," although he had one at hand in the 'Tractatus' of Hues. This latter agrees with a similar table in the Cosmographia of Apianus,¶ and it is possible that Carpenter wished to have a more recent table. After drawing upon Blundeville for "the first finding out of the longitude of places," Carpenter adds a new method

aquam esse rotundas," but throughout is much indebted to this commentary on one of the most popular of Mediæval writings. He also used two other works by Clavius, the 'Gnomonics' and the 'Isoperimetris.'

* Dr. William Gilbert, 'De magnete magneticisque corporibus et de magno magnete tellure,' 1600.

† 'Certaine Errors in Navigation, arising either of the ordinarie erroneous making or using of the sea chart, etc., detected and corrected by E. W.' 1599. A new and much enlarged edition was published in 1610.

‡ The reference to this mathematician has not been checked.

§ Marchese Guidubaldo del Monte, 'Planispheriorum universalium theorica,' 1579.

‖ Bartholomew Keckerman, 'Systema Compendiosum: totius mathematices, hoc est, Geometriæ, Opticæ, Astronomiæ, et Geographiæ,' Hanover 1617. This appears to be an enlargement of an earlier work published in 1611. Cf. especially Carpenter, I 133–4 and 167, with Keckerman, pp. 441–2 and 492 respectively.

¶ Hues (Hakluyt Soc.), p. 136; 'Cosmographia' (1584), p. 42; and Blundeville, p. 394.

" by the observation of the difference in the Sunnes and Moones motion." This, he explains, he " first found in Mr. Purchas his relation of Hall's discovery of Groenland written by William Baffin since this chapter came under the Presse ; * the expression of which, being as I suppose shorter and easier than in the Author I doe owe for the most part to . . . Mr. Nathanael Norrington."

There is much in Carpenter's first book which is not strictly geographical, and it is with some relief that one turns to the second, where there are several sections not found in other geographical works of the period. It opens with a chapter dealing with the habitability of the world, in which the author explains that the changes to which the Earth is subject may account for the emptiness of regions naturally habitable. Carpenter then passes to deal with the mathematical aspects of Topography, drawing from Gilbert's work explanations of the relationship of places both to each other and to the heavens, and so leading to " the manner of Expression and Description of Regions " and " the use of instruments for finding out the Position of two places." But any one desiring " more particularly to acquaint himself with the use and divers manners of descriptions of Regions . . . [should have] recourse to diverse Authors who have particularly laboured in this subject ; amongst which our two Englishmen, Digges † and Hopton ‡ deserve not the least praise: whereof the latter, out of these principles hath framed a curious instrument which he calls his Topographical Glasse, whose use he hath perspicuously and exactly taught in diverse pleasant conclusions, too large for the scope of my methode to insert."

Chapters v to viii deal with Hydrography defined as " a Description of the water with the Accidents thereunto belonging." Here one gets an insight into Carpenter's attitude towards Biblical criticism. He takes for granted " that Almighty God . . . in the beginning made a separation betwixt the waters above the Firmament and the waters under the Firmament," but leaves the meaning of the first class " to learned devines and critick expositours to dispute." The waters under the Firmament, originating at the Creation when God said, " Let the waters be gathered into one place," presented a problem, for no one had satisfactorily explained why they should so remain. It cannot be, as St. Jerome said, because " God set a bound upon the seas which they should not passe," for that would " impose a perpetuall violence upon nature." § Neither can it be explained by the action of the stars nor by

* " The fourth voyage of James Hall to Groenland . . . written by William Baffin," Purchas, ' Pilgrimes,' III 831.

† Leonard Digges, ' A geometrical practise named Pantometria,' 1571.

‡ Arthur Hopton, ' Speculum Topographicum : or the Topographicall Glasse containing the use of the Topographicall Glasse, Theodelitus, Plaine Table and Circumferentor,' 1611.

§ Such phrases are very characteristic, but that quoted here is not original, being taken with a large amount of material from ' Enquiries touching the Diversity of

the supposition that there is more water than land in the Globe. "It seemeth more probable to imagine that either the waters are condensated, and thickened, which were in the beginning created thinne: whence will follow that they should occupy a lesse place, and by consequence leave the dry land in many places habitable: or, what is more probable, that God in the first creation made certaine hollow cavities and channels in the Earth, which was before plaine and uniforme; into which the waters were received and bounded in so much that they could not flow abroad." This leads naturally to a discussion on the salinity of the sea-water, the cause of which is given as evaporation, although since "the saltness is radically or originally in the matter of the water . . . the Sunne is a disponent though not a productive cause of the saltness of the sea."

Currents, tides, and winds are dealt with in chapter vi. Carpenter seems to have understood the relations between the winds and the currents, although he is not convinced that the winds of the Persian and Indian seas are the cause of the currents found there. At this point he introduces a new source and, as usual, borrows freely from it. It is another of the writings of Keckerman,* and from it is taken the account of the Baltic Sea (II 94), much of the section on surface movement, and the greater part of chapter vii, dealing with the "Depth, Situation and Termination of the sea." Carpenter points out how the task of writers is made difficult by the numerous reports of fresh discoveries and ends with a discussion of the North-West Passage taken from the treatise of Sir Humphrey Gilbert. The subject of Hydrography is closed by a short chapter (viii) on "sea traffique and merchandize," also derived from Keckerman's 'Brevis Commentatio Nautica,' in which Carpenter shows a clear appreciation of the advantages of transport by sea and the economic conditions which regulate trade.

The four chapters which follow deal with the land and its features. A few of the many interesting passages have been selected to illustrate Carpenter's contribution to geographical inquiry and the position of the science in his days. Thus there is the suggestion that changes in the courses of rivers "may be due to the wasting or cutting down of great woods on the earth." Again, there is the importance of river valleys as sites for towns, "first because by means of such water they have quick passage and traffique . . second such a site is most convenient for purging away filth . . . thirdly because such rivers yield store of fish . . .

Languages and Religions through the chiefe parts of the world,' by Edward Brerewood, 1614, pp. 110 *et seq.* The actual phrase is found on p. 112. The general idea may have been taken from Keckerman, *op. cit.*, p. 580. Elsewhere (II 107) when refuting the views of St. Basil and others on the relations of land and sea, Carpenter remarks, "Neither were the authority of these Divines so great in these Cosmographical conceipts to oversway these of the same profession who could more easily judge of these matters."

* 'Brevis Commentatio Nautica,' Hanover 1603. The reference to the Baltic is on p. 45; that to sea-level on pp. 29 *et seq.* For surface movement cf. chapter iv.

fourthly [water would be near in case of fire] . . . lastly amongst other reasons we cannot forget the pleasantness of faire rivers, which are no small ornaments to a city, and delights to the eye of the Inhabitants."

Chapter x, on " Mountaines, Valleyes, Plaine Regions, Woods, and Champain Countreys," includes an interesting section taken from a work by Blancanus.* The general proposition is that " Mountains since the beginning of the world have still decreased in their quantity, and so will continually decrease untill the end," and " the causes we shall find to be the water, as well of Rain as Rivers. . . . We see plainly that Raine water daily washes downe from the Toppes of mountains some parts of the earth ; whence it comes to pass that the highest mountains are harder and more rocky than others, as being more able to resist this violence of the water." While mountains are thus reduced " in plaines and valleys we find all things to happen contrarywise, to wit, that all places in regard of their superficies are raised much higher then they were in times past. The reason whereof may easily be given out of the great quantity of earth carried by the washing of the Raine from the tops of the mountaines into the valleys. . . . An instance we have in some of the lower places in Somersetshire, where some upon occasion digging the earth somewhat deep, have found great oakes. . . . To conjecture with some that this was caused by Noah's Floud, seemes to be very improbable " (II 175–6).

One other example of Carpenter's treatment of physiography deserves notice. It is practically copied from " Verstigan a late writer " † who is discussing the formation of islands and cliffs. " Everyone may see by ordinary observation that the Clifts and bounds of the sea (as not being by God in the creation so formed) seeme not onely severed and broken, but (as it were) cut streight and steepe downe from the top to the bottom, not stooping or declining by degrees ; as we see in the Inland hills in their descent into the vallyes. The forceable breach of the land (as we pretend) by the sea fretting through some narrow place, seemes the more to be confirmed in that we find it not steep towards the land, where the land declines by a sloping descent as in other places ; but rather towards the sea in such sort, as both the sides of a narrow streit sea oftentimes in the nature of the soile, and conformity of figure, seeme to answer the other ; only shewing the want of substance betwixt them which is lost. It may hence be objected that many other hills and rocky places of Inland

* Josephus Blancanus, ' Sphæra mundi seu Cosmographia,' Bonn, 1620, pp. 82–5. Carpenter writes, " This observation Blancanus, I know not how truly, ascribes to his owne Invention : but to what Author soever we owe it, we must needs acknowledge a pleasant speculation, grounded on good reason " (II, 174). The example of Somerset appears to be an original contribution of Carpenter. This work is used elsewhere, *e.g.* I, 74, 123.

† R. Verstegan, ' A Restitution of Decayed Intelligence : in antiquities.' Antwerp, 1605, pp. 88–111. The passage quoted is part of a discussion of the former land connection between England and France to which Carpenter elsewhere refers (II, 112, 190).

Countreys seeme in like manner as broken and steep downe as these clifts bounding the ocean: as also that the clifts towards the sea are broken higher up than anywayes the sea could be imagined to ascend. To this we answere, first that rocks on the dry land may sometimes seeme broken when indeed they are not, being by nature fashioned craggie and uneven; secondly whereas Hills in Inland Countries seeme broken, this might proceede heretofore by Earthquakes which have oftentimes bin observed to produce such effect . . . and for the appearance of such breaches in the tops of cliffs above the ascent of the waters, it might be caused by the violence of the sea waves, fretting and eating out the sides of them beneath the bottome: whence it happens that the higher part for want of under-propping must needes fall and breake off from the other" (II 187–8).

The last four chapters of the second book deal with the "civil affections" of the land, that is, "those which concerne the Inhabitants." In many ways this is the most interesting part of the whole work, and it shows clearly that Carpenter had a larger conception of Geography than most of his contemporaries. This again is not original, being derived largely from the writings of the French savant Jean Bodin. Contrary to his usual custom Carpenter refers by name to his source, although he frequently copied much more than one might suppose from such references.* The work to which Carpenter refers is 'Methodus ad facilem historiarum cognitionem,' 1566, but he probably knew of the later 'Six livres de la République,' in the fifth book of which Bodin elaborated his earlier theories. An English translation of this larger work appeared in 1606 (by R. Knowles). Carpenter used chapter v of the 'Methodus' very extensively. The French writer had developed, more fully than the classical authors, the relationship between physical conditions and historical progress, and most of his conclusions were adopted by Carpenter. The inhabitants of the world are divided into northern, middle, and southern types, each with characteristics related to their environment. Thus "the extreame Inhabitants towards the Poles are more naturally inclined to mechanicall works and martial endeavours: the extreame towards the Aequator to workes of Religion and Contemplation: the middle to lawes and civility." Again, "mountain people are for the most part more stout, warlike and generous then those of plaine countries, yet less tractable to government." A change of environment produces a change in manner for "colonies transplanted from one region into another, farre remote, retaine a long time their first disposition, though by little and little they decline and suffer alteration." But Carpenter did not slavishly follow his authority: he noted exceptions to the general principles set out, among which were "our mountainous Provinces of Devon and Cornwall" which "had not deserved so ill as to be sharply censured for Blockishness or Incivility." The work ends by showing,

* *E.g.* compare Carpenter, II 234–5 with Bodin (edition of 1583), p. 109.

as Bodin had done, that man is not solely influenced by the conditions of his environment.

Two other points deserve notice, the first of which relates to the supposed insularity of California. The matter is twice mentioned. On the first occasion Carpenter is showing that increase in knowledge has led to a modification of views, and quotes as an example " California of late thought to be part of the Continent, and so described in all our Mapps; yet since by a Spanish Chart taken by the Hollanders, discovered to be an Iland " (II 115). Again, in the section dealing with the North-West Passage readers are referred to " a curious Mappe not long since set out by our worthy and learned Professour Mr. Brigges," and are given, " in his own words," the views of Brigges on the question at issue.* But Carpenter adds a criticism. " These arguments, I confesse, have swayed my opinion, but not as yet absolutely freed me from doubt. . . . That California is an Iland, it may (for ought I know) be well warranted: But the evidence drawn from the Spanish Chart seemes rather to cherish hope than perswade consent." One suspects that he had read a few pages earlier in Purchas † " that either of negligence or overbusie diligence Maps by Portugals in the East and Spaniards in the West have been falsely projected." ‡

The second point concerns the Globes to which Carpenter refers. Although he appears to have used the ' Tractatus ' of Hues he nowhere mentions the globes of Molyneux, to which the treatise was complementary. He does however name two others. Of one he says, " Groenland supposed in most of our globes and mappes to be an Iland . . . is set down directly under the first meridian passing by the Azores in Kaerius his globe." This may be a reference to the globe of Kaerius issued in 1614, of which a specimen, in gores, is preserved in the Bibliothèque Nationale. It bears the inscription " Petrus Kaerius excudit anno 1614," while in a scroll at the end of a legend is a further note, " Petrus Kaerius et Abrahamus Goos patrucles scalptores." § There is evidence that this globe was used for some time after its issue. The second reference is of more interest. In his first book Carpenter writes,

* Purchas, ' Pilgrimes,' III pp. 852–3. The map is inserted between these pages.

† *Ibid.*, p. 848.

‡ It is interesting to compare the notices of California found in the works of Cluverius and Varenius with that given here. The first writes (Lib. VI cap. 13): " California, quæ inter sinum cognominem (quem Hispani Mar Vermeio, id est, mare Rubrum vocant) et mare Pacificum ceu peninsula excurrens, solo est arido, sterili atque deserto." Varenius in his section on large islands (Cap. VIII Prop. 4) writes: " Hisce annumeranda est California, si ea insula est et non pars Americæ, Belgæ enim in quadam Hispanica navi repererunt Mappam Geographicam, quæ Californiam insulam et mari cinctam exhibebat non adhærentem Americæ." Later (Cap. VIII Prop. 10) he gives " California, ad Occidentale littus Americæ Septentrionalis prope mare Vermejo. Sed recentes observationes eam insulam perhibent."

§ M. Isnard, Keeper of the Maps in the Bibliothèque Nationale, kindly supplied this information. Dr. Stevenson refers to a globe of Plancius, engraved by Kaerius

". . . this Spheare of Archimedes I take to be more than an ordinary Globe commonly used among us, as may appeare by the Poet's * description; so that it may rather be likened to the Spheare lately composed by Cornelius Trebelius, † and presented unto King James. . . . But of such kind of globes having never yet had the happiness to see any, I intend no description" (I 162). The instrument to which Carpenter refers is mentioned in the 'Nouvelle Biographie Universelle' as "un globe de verre dans le quel il [Drebbel] produisit, par le moyen des quatres éléments, le mouvement perpetuel." It is fully described by its maker in a letter to James I printed as an appendix to a book by Drebbel, ‡ and published in a Latin translation at Hamburg in 1621. Apparently the king did not understand the machine, and Drebbel wrote him a further letter § giving a fuller explanation.

It remains briefly to indicate so far as is possible the influence which this work of Carpenter had on contemporary and later geographical writings. It is well to state at once that such influence does not appear to have been great. The book dealt only with the general aspects of geography; and, what was perhaps more serious, it had to meet the competition of newer books. Cluverius set a standard for concise general and regional geography, || Varenius produced a classical work on general geography, and Heylyn catered for popular taste with a brief mention of general principles and a long account of the regions of the world. Later geographers borrowed very largely from these works, and Carpenter was forgotten.

Dr. Mill has expressed the opinion that Varenius probably knew of Carpenter's book. Several passages, as that relating to California quoted above, point strongly to such knowledge, but they are not conclusive evidence; and, as Varenius certainly knew of the 'Geography' of Golnitzius (Amsterdam, 1643) who, like Carpenter, borrowed freely from the works of Keckerman and other well-known writers, it is possible that the similarity is due to a common source.

Nor is it possible to say how far, if at all, Heylyn was indebted to Carpenter. Both in the later editions of his 'Microcosmos,' and in his larger 'Cosmographie,' there are passages which seem to prove a know-

and Goos, but does not mention any globes produced by Kaerius under his own name ('Terrestrial and Celestial Globes,' II 48).

* The reference is to Claudian.

† *I.e.* Cornelius Drebbel.

‡ Tractatus duo: Prior de natura elementorum . . . Posterior de quinta essentia. . . . Accedit eiusdem Epistola ad sapientissimum Britanniæ monarchum Jacobum de perpetui mobilis inventione.

§ This second letter has been printed, with a short notice of Drebbel, in the *Miscellany of the Abbotsford Club*, vol. I p. 105 (1837).

|| An Oxford edition of his 'Introductio ad generalem geographiam' appeared in 1657, and an English translation in the same year. The preface to the latter explains that "the work of the learned Cluverius . . . hath found a generall acceptance through the reiterated editions thereof in England and elsewhere."

ledge of Carpenter's book, but they may have been taken directly from Keckerman, whose works were certainly used by Heylyn. His activities in the University subsequent to the year 1617, when Carpenter was still in residence at Oxford, and his reference to "the difference . . . between geographie and chorographie, which to some men, not rightly looking into the nature of both, seem to be the same," go far to justify the assumption that Heylyn knew both the man and his work.*

Throughout the century Heylyn's book was much read, and in 1701 Edward Wells, in his preface to 'A treatise of Antient and Present Geography,' could refer to it as "of good Use by way of superstructure . . . being a Treasury containing together with Geography a pleasant variety of other useful learning." There appears to have been little geographical work published during the Commonwealth and Protectorate period, but geographers of the Restoration era took Heylyn for their model. Much of the 'Cosmographia, or a view of the Terrestrial and Celestrial Globes' by John Newton (London, 1679), is derived from Heylyn. Similarly, Laurence Eachard used Heylyn's book for his 'Compendium of Geography, General and Special,' the second edition of which appeared in 1691. In an appendix to that work the author gives a list of "the most considerable writers of Geography." Among those of modern times "we have Niger, Munster, Mercator, Ortelius, Boterus, Maginus, Bertius, Cluverius, Avity, Brietus, Johnson, Bleau, Riccioli, and others; † these are in Latine. Our English Geographers are chiefly Grimston, Heylen, Speed, Ogleby, Bloom, Authors of the English Atlas; with the lesser ones Morden, Meritan, Seller, Moor, Chamberlain, Clarke, with others too many here to name." One wonders if Carpenter was thought of among that last class, but a glance through the list suggests significantly that the great geographers were those who dealt largely or solely with description.

The geography of Varenius rapidly took its place as the standard authority for "general" geography. Apart from the Amsterdam editions, of which there were four between 1650 and 1672, Newton edited two at Cambridge (1672, 1681), and it is impossible to believe that Eachard was ignorant of it, in spite of the fact that "tho' many Hundreds were then printed at Cambridge . . . yet by being frequently read in both Universities, all the impressions were in time sold off, so that their Scarcity among the Booksellers was observed by the Reverend Dr. Berkey to be a great Detriment to the Young Gentlemen of Cambridge in perfecting their studies." ‡ It was certainly known to, and used by, other writers of this period, among whom were Blome, Moll, and Senex.

* Heylyn lectured on cosmography at Magdalen College in 1617 and subsequent years (Wood, *op. cit.*, III 552). He was also involved in a controversy with Prideaux, the Rector of Exeter College. The quotation, which is from Heylyn's 'Cosmographie' (1652), p. 27, should be compared with Carpenter's opinion (I 3–4).

† All of these writers whose works appeared before 1625 were known to Carpenter.

‡ Preface to the English Translation of Varenius, 1736, p. iv.

But it should be noted that in these books the "general" and technical geography takes second place. This was no new thing, for Varenius himself in his "Epistola Dedicatoria" complained of the neglect of general principles and said that he wrote his book with the intention of remedying this defect.

Apart from the testimony of Varenius and the general popularity of Heylyn's work, the fact that the short book of Pemble * had reached a fifth edition by 1675 confirms the suggestion that there was little demand for lengthy works on general geography. This may help to explain the neglect or eclipse of Carpenter's book. In spite of this Carpenter deserves to be remembered for his caution, his common sense, and his skill and judgment in the use of authorities, which were in almost every case the best available. His book thus throws a valuable light on the geographical literature of the period, while its closing words, "'Tis enough to judge as we find, and walke where the way is open," may well serve as a motto for geographers of all time.

Nor does his claim to recognition rest on his book alone. Hearne † speaks highly of his learning, observing that after his election to a Fellowship "Carpenter . . . by Herculean Industry became a noted Philosopher, Poet, Mathematician and Geographer, insomuch that he found great respect from the Academians and was not a little resorted to by such of them as were deficient in those studies."

There is good reason for suggesting that Carpenter may have given lectures in the subject of cosmography, although there is no definite proof. All that can be said with certainty is that the statutes of Exeter College at one time required "that during every long vacation the Lecturer in Classicks shall read . . . the rudiments of cosmography at least four days in every week unless such days are festivals," but that by 1739 the custom was no longer observed.‡ A resolution passed in that year explained that former lecturers had always kept the statute.

The writer wishes to acknowledge much valuable assistance from the Rector of Exeter College, who kindly examined the College records and answered a number of inquiries; from Dr. R. T. Gunther, Curator of the Lewis Evans Collection of Scientific Instruments, Oxford; and especially from Mr. E. Heawood, who read the MS. and made many helpful suggestions.

* 'A briefe introduction to Geography,' written before 1618, but published in 1630.
† Rawlinson MSS., c. 146, fo. 346.
‡ Boase, *op. cit.*, 355.

ACROSS THE JOHN CROW MOUNTAINS OF JAMAICA:

from a narrative communicated to Lord Olivier by

REGINALD M. MURRAY, M.B.E.

THE John Crow Mountains, running from north-west to south-east, divide the valley of the Rio Grande from the eastern coast of Jamaica. In the past they have been regarded as a plateau of about 2000 feet, rather than as a mountain range, with barren waterless tracts of limestone, largely covered with sharp honeycomb rocks at the higher levels. Our journey showed that 2000 feet is an underestimate; that the feature is really a mountain range, and that, far from being barren, it is covered with dense tropical jungle. The Rio Grande flows along the western foot through a most fertile country, receiving several short perennial streams from the slopes. On the east, Drivers river and Priestman's river rise among the low foothills.

As far as I have ascertained, two parties have crossed the mountains. Inspector Herbert T. Thomas, in his 'Untrodden Jamaica,' describes how in September 1890 he climbed from Bath to the Peak, descending the eastern slopes to Priestman's river. The other crossing was made in 1920 by Mr. Scoresby Routledge, when with a party of ten carriers he travelled from Mill Bank north-east to Fair Prospect in three weeks. With Dr. Campbell, of Port Antonio, he returned shortly afterwards to Mill Bank in a week. He has published no account of his journey.

Considering it to be inelegant and meaningless, Inspector Thomas endeavoured to get the name changed to Blake Mountains, in honour of the Governor, Sir Henry Blake; but despite an Order in Council, the old name has persisted. It may not be altogether meaningless, for our carriers informed us that crows (*Cathartes aura*) frequent this secluded range as a nesting-place, and that their simple nests—a few dried sticks in a cleft—are frequently met with by woodmen on the western slopes. Certain superstitions have gathered about these mountains: the Maroons think that no party attempting a crossing will return intact, and that success will be attended with disaster to the Maroons themselves. We were also warned of snakes, venomous insects, and poison bush, none of which we saw.

Our party consisted of Dr. Ernest Murray, his son Hugh, Mr. Cunningham and myself. We were invited by Mr. E. H. L. Massy of Mill Bank to use his home as a base, where we arrived on July 19. Mr. Massy had engaged three men as carriers and cutters, two of whom had crossed with Mr. Routledge: all these men behaved admirably throughout the journey. The next morning we set off at eight o'clock with rations for five days. Across the Rio Grande, the mountains rise steeply like a wall, culminating in the south-east in a peak computed by Inspector Thomas to be 3355 feet. On the lower slopes to a height

of 1500 feet are plantations of yams, corn, and bananas, with clusters of bamboos and solitary palms. Climbing by easy tracks through the fields, we rapidly reached the edge of cultivation, from the highest fields the men gathering provisions for the journey, and entered a forest of palms and tree ferns—rodwood, boargum, ironwood, and wild cinnamon. Here the overhead foliage was so thick that we were not at all inconvenienced by the sun. At noon we halted at a waterhole, the last we were to find for several days. From this point the path grew steeper, and we were worried by numbers of mosquitoes and large flies. Once or twice we saw the rare and magnificent *Papilio Homerus*, but always out of reach. We encountered no wild hogs or conies, though the tracks of the former were often visible. At 3.30 we reached the crest, where the men built a comfortable hut of thatch.

That evening we made some slight alterations in our plans. Though our rations might be made to last for eight or nine days, the supply of water was more doubtful. We did not know when it would be met with again, and it had taken Mr. Routledge three weeks to cross the mountains. It was finally decided to send two of the men back next day for more water and food, while the remainder pushed on blazing a trail for them. We were to travel due east for Manchioneal. Next morning we had to wait until eight o'clock before there was sufficient light to move off. Throughout, the sun was too obscured by mist and foliage to serve as a guide, and we relied almost entirely upon the compass in penetrating the dense vegetation. At first the going was not difficult, ordinary tropical forest on an undulating surface, until at noon we reached the barrier—honeycomb rock. Here were cavities up to 20 feet deep, concealed beneath a tangled mat of reddish-brown roots, through which we had to hack our way with the cutlass. This growth bore a remarkable resemblance to the sea-side mangrove. A specimen which we brought back with us was identified by Mr. Rendle, of the British Museum, as a species of *Clusia*, not hitherto recorded from the John Crow Mountains. This " honeycomb-jungle " is the main obstacle to the exploration of the plateau. In the cavities are masses of rotting leaves to which the jungle roots descend, while the surface is covered with a deceptive tangle of branches, ferns, mosses and fallen tree-trunks. Progress was only possible in single file, by using these trunks and roots with caution as bridges. A mishap would have seriously endangered the success of the expedition, and progress was therefore slow. That afternoon we heard shouts from the west, and were soon joined by the two men, who with remarkable speed had returned from Mill Bank and overtaken us with fresh supplies. We camped that night in an open patch, where the men again built a hut.

On Thursday we started as soon as the light allowed. The plateau appeared in general to slope slightly to the east. This slope was not continuous, but rather a series of steps pitted with honeycomb, each step ending in a rocky knoll with jungle of a stouter growth. The only birds

we saw on the plateau were humming birds, which were quite common. There were few mosquitoes, no orchids or flowers of note, but in the hollows numerous varieties of ferns. A curious feature was the "sea-bawl," as the carriers called it—a crater of rock with a cylindrical shaft in the centre. We could not arrive at a satisfactory explanation of this term: it was suggested that "bawl" is a corruption of bowl. The Maroons believe that the shaft reaches down to the sea, which would explain the term. It may, however, be merely a local variation of "sink hole," a common term in Jamaica for a natural pit.

We now advanced in stages of 50 yards, the growth being cleared by the cutters. From the top of each knoll, we could see nothing ahead but the next step and its terminal knoll. The stillness was broken only by the intermittent call of the solitaire (*Myadestes solitarius*), often quite close but never visible. At five o'clock we camped on a knoll, a mass of roots above numerous cavities. As no thatch was found, an uncomfortable night was spent in the open. During the night the fire burnt through the covering of roots, but no one was precipitated into the cavity.

We moved off early on Friday morning by short stages, as on the preceding day. The feet of the oldest carrier were badly cut, but he persisted with unimpaired energy and determination. At nine o'clock the mist cleared, and from a knoll we had a good view of the eastern end of the island, and our objective due east, the harbour of Manchioneal, with the white breakers on its reef. Our water supply was lasting well, as every one had been sparing of it. I had been able to proceed with a single bottle only, thanks to the limes I had. Two members of the party had supplemented their store by tapping and boiling wild-pine water, which seemed quite wholesome, a source of which woodmen avail themselves in extremity. The vegetation was now rapidly changing, honeycomb rocks were disappearing, the descent was becoming noticeably steeper; we were leaving the plateau. The soil was deeper and richer; there were clusters of wild ginger and tree ferns, and thatch was plentiful. This mountain side was admirably suited for cultivation, and the men declared that the soil was particularly good for bananas and corn. We camped in the open, this time with sufficient thatch for bedding. The night seemed unusually warm for so high an altitude, and some rain fell.

Next morning was bright and warm. One of the two dogs with us was found to be missing, but he eventually reached Mill Bank three days later. At this stage we had expected precipices, but we encountered none, and the rope was not required. In the afternoon we came upon traces of woodmen, old cutlass marks on trees, in an open forest of great fertility. There were acres of handsome palms and timber trees similar to those of the western slopes, including several magnificent cedars. By six o'clock we struck a road near Vineyard Hill, and late in the evening reached Manchioneal, and, securing a truck, returned to Mill Bank at midnight.

NOTE ON SIR FRANCIS YOUNGHUSBAND'S URDOK GLACIER

MAJOR KENNETH MASON, M.C., R.E.

SINCE plotting the map of the Shaksgam valley by the Wild Autograph, I have gone very carefully into the probable position of the Urdok Glacier. I have come to the definite conclusion, from the lie of the ridges as shown by the Autograph, considered with the latitudes and account of Sir Francis Younghusband, that the Indira Col of the Workmans lies at the head of a source of the Urdok Glacier, and that it is shown approximately one mile too far north on the Workmans' map. It is also possible that the Turkistan La is shown about the same distance too far east, on the same map.

A brief summary of my reasons is given below.

As will be seen from the map of the Shaksgam published with my paper on "The Stereographic Survey of the Shaksgam" (*G.J.* 70, 416, October 1927), on which map the watershed of the Muztagh–Karakoram Range has been dotted in according to the Workmans' map (*G.J.* 43, 232, February 1914), we plotted a ridge with a north-north-west trend, and carrying peaks 20,250, 21,300, 20,800, and 20,200. This ridge I then believed enclosed the Urdok Glacier on the east. The alignment of this ridge, if produced, meets the watershed in the vicinity of the Indira Col.

On the same map are shown the graticules of the three latitudes observed by Sir Francis Younghusband, when he was moving up the Urdok Glacier, mainly by its western lateral moraine. It will be seen that the direction of the glacier, where it is west of, and probably parallel to this ridge, and between latitudes 35° 48′ 05″ and 35° 45′ 45″ is in close accord with that shown on the sketch-map of Sir Francis. The distance between the two graticules is also reasonable, 3 miles in each case.

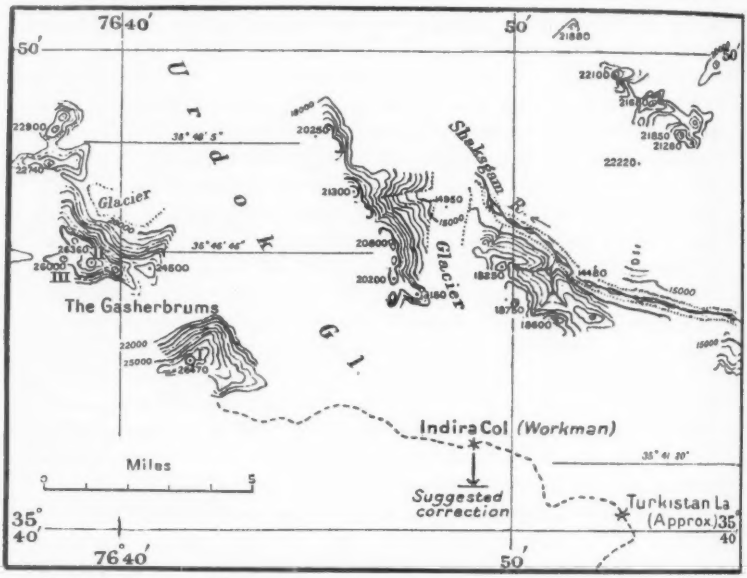
On the other hand, if the dotted line of the watershed is exact, the direction of Sir Francis' route from 35° 45′ 45″ must bend east-south-east or almost due east, and must be almost parallel to the watershed. This is neither apparent from his map nor likely from his account. The route between latitude 35° 45′ 45″ and 35° 41′ 20″ must also be at least 9 miles, which I believe is much too far to be covered in one day on such ground, and in the bad weather experienced by Sir Francis.

The glacier whose lower reach was pinnacled and is shown on my autograph map in longitude 76° 49′, east of the ridge mentioned above, is ruled out of the discussion by the fact that it joins the main valley south of latitude 35° 48′ 5″, which was observed by Sir Francis at the end of his first march up the Urdok, whose lower reach is hummocked with moraine.

Now if we assume that the Indira Col is south of the last latitude taken by Sir Francis, viz. 35° 41′ 20″, we can fit in the head of the Urdok Glacier to suit all considerations. It must be remembered that the upper

portion of the Siachen Glacier basin was not surveyed by Grant Peterkin, nor by any one else. I have in my possession a note by Peterkin that the Workmans' map here is unreliable, being sketched from photographs. Any one who knows the extreme difficulty of judging distance when walking over soft snow at high elevations, will readily allow that a mile error in the *estimation* of a distance on the ground or from a photograph is very easy to make.

If we accept this position of the Indira Col, then "the large glacier flowing north-north-east," which was seen from it, is the Urdok. The "long splintered rock-ridge" is the continuation of the ridge surveyed



Part of the map illustrating Major Mason's Stereographic Survey of the Shaksgam (G.J. October 1927)

by us and mentioned above.* One source lay about 5000 feet below the Indira Col, at an altitude of about 15,500 feet,† while to the west, on the eastern flanks of Gasherbrum I is another.

The "wide-trunk" glacier, seen from the Turkistan La, and joined by a short crevassed glacier below the saddle, is probably the glacier

* Sir Francis Younghusband describes this ridge thus (*Proc. R.G.S.* 14, 212): "The mountains on either side of the valley (*i.e.* the Urdok), especially on the eastern side, are extremely rugged and precipitous, affording little or no resting-place for the snow, which drains off immediately into the glacier below."

† Workman, whose hypsometer height of Indira Col was 20,860, reported the glacier below to be about 5000 or 6000 feet below. The height of Sir Francis Younghusband's last camp on the glacier was recorded by him as 15,355.

whose lower reach was mapped by the Autograph in longitude 76° 49′.* The "grand group of peaks" to the south-east is, I believe, none other than the Teram Kangri group, looming up through the clouds, and appearing closer than they actually were.

The high ridge containing the three lesser Gasherbrum peaks throws a long spur northwards. We mapped and contoured this with the Autograph for a distance of 4 miles. I have identified points on it in the stereoscope with points in the photograph taken by Sella and shown as Panorama F in De Filippi's book of the Abruzzi expedition. This is the ridge that divides the Urdok Glacier from the glacier which drains the area between the Gasherbrums and Broad Peak, and which was seen by the Duke of the Abruzzi's party from the Sella Pass.

Sir Francis mentions three branch glaciers entering the Urdok from the west. One of these drains the southern slopes of Gasherbrum; the second drains from between Gasherbrum I and Gasherbrum II, III, IV. The head of a third was plotted by us immediately north of Gasherbrum II. We may compare these western glaciers of the Urdok, and its precipitous eastern wall, with those of the Kyagar Glacier which we surveyed accurately on the 1 : 50,000 scale in the Autograph.†

There may be an eastern head of the Urdok swinging round from the Turkistan La and separated from the Indira source by the "triangular massif" mentioned by the Workmans, in the same way that the two promontories—or "triangular massifs"—of the Apsarasas divide the head basin of the Kyagar. But if this is so I am inclined to believe that the Workmans' map shows the Turkistan La too far east by at least a mile. But this last depression cannot possibly be the "Younghusband saddle," for it faces east, and would not be seen until the triangular massif had been rounded by Sir Francis.

I am convinced that Sir Francis was ascending the ice-slope at the northern foot of the Indira Col, when he was finally checked by a crevasse.

* This glacier was seen by Sir Francis, *vide Proc. R.G.S.* 14, 210: "Another glacier could be seen to the south."

† See the reduced map of the Kyagar Glacier on the same sheet accompanying my paper in the *Geographical Journal.*

MARCO POLO

MARCO POLO. IL MILIONE. Prima Edizione Integrale, a cura di LUIGI FOSCOLO BENEDETTO. *Florence: Leo S. Olschki* 1928. 14×10 *inches*, ccxxi+283 *pages and* 13 *plates, three of which are coloured. Lire* 600

FOR more than half a century the Book of Ser Marco Polo the Venetian seemed to have attained its definite completeness in the classic edition of Sir Henry Yule, so perfectly attuned to the epic subject and to the genius of the protagonist, and apparently cleared of every doubt and obscurity by the clear-sighted and scholarly comment of the editor. It would be unfair to omit to mention side by side with it another great English edition of the Travels—that of William Marsden, first issued in 1818, and several times since, up to 1926, which has deservedly competed with the Yule version in renown and popularity. To all appearances, Polo's book had taken its place in its settled form amongst the classics of geography.

And here comes a work which seems bound to revive the whole Polo question from its foundations, and to become the starting-point of an entirely new set of studies and researches. Every former edition of Marco Polo had been merely the reproduction of one of the most celebrated texts which have come down to us, or at the most there had been an attempt to complete it with items selected from one or two other sources; but none was based on the comparison and analysis of *all* the textual material in existence. Such a work could only be undertaken by a philologist and a paleographist. Now for the first time this inquiry has been made by a competent scholar, with a method and a thoroughness which have had their reward in the importance of the results attained. The selection of the text had previously been made without a real philological foundation, and was based on preconceived ideas and traditional prejudices which could only be proved false by an expert in the interpretation of manuscript codices.

Thus a large majority of students have held that the so-called "Geographical Text" of the Paris National Library, certainly the oldest and the most complete of all, was a faithful and exact reproduction of the original Genoese text. It is from the "geographical text" that H. Murray's translation was made (1844). Others have accepted Grégoire's version in correct French as representing the original revised and approved by Marco Polo himself, and as such it was published by Pauthier (1865), and was chosen, not however without reservations, by Yule as the basic text for his translation. Then again, the Italian version, under the garb of the *Codice della Crusca*, had an undeserved diffusion and popularity in Italy, to the detriment of the much more valuable text of Ramusio. It is easier to understand that the version in Venetian dialect should have been mistaken for the original, being written in the language of Polo's own city. Prof. Benedetto has brought order and clarity into the whole question.

His search has been extraordinarily fruitful, having led to the discovery of sixty new MS. texts to be added to the seventy-eight catalogued by Cordier in the third edition (and supplement) of Yule's Polo. Cordier's lists really mention ninety-two; but fourteen of these are shown to be duplicates, or to refer to lost texts, or to printed copies. There is no attempt at classification, the texts being merely indexed according to the language in which they were written, or to the countries and libraries in which they are to be found.

The careful analysis and comparison of this huge material, scattered all over Europe in about fifty different libraries, has allowed Prof. Benedetto to divide it into various groups, each derived from a single archetype. He has established

the fact that these archetypes were originated from older texts now lost. None of the known texts, not even the " geographical text " of Paris, is a correct and complete reproduction of the original Genoese book by Rustichello. Fortunately their gaps and lacunæ are different, so that it is possible to gather from them, sometimes even from those reduced to mere fragments, the elements and material for the restoration and completion of the most authoritative of all, which is undoubtedly the " geographical text." It is impossible to follow in its details Prof. Benedetto's learned and convincing demonstration. One single group, derived from the Venetian version, contains more than eighty different texts, linked by the most complicated derivations, translations and re-translations. To this class belongs the famous Latin text of Friar Franciscus Pipino, which had the widest diffusion in the Middle Age and after, and was the origin of many translations.

Friar Pipino's version brings Benedetto to Ramusio, the Italian Hakluyt, whose account of Polo's voyages (1559), founded on Pipino, was the base of Purchas' account of Polo, and of the admirable edition of Marsden. The version of Ramusio has long been one of the most discussed subjects in the whole Polo question, because it contains passages which were not to be found in any of the known texts. Prof. Benedetto has traced all the sources of this Italian version. First and fundamental, Pipino's text ; to which are to be added four others, one of which is the long-sought Latin text " of marvellous antiquity " spoken of by Ramusio in his Introduction. Benedetto was fortunate enough to discover a copy of this text in the Ambrosiana Library of Milan, and in its pages was able to identify all the interpolations of Ramusio's text which had not been found in the other MSS., besides many more new items of which Ramusio had not made use, and which are of great importance for the restoration of the " geographical text." This material is certainly genuine. There are new details on China proper which prove that Polo was not unobservant (contrary to criticisms aimed at him) of its high civilization and cultural development ; there is a new chapter on Russia, and one on Khara-khoto, the buried city of Central Asia which was explored by Col. Kozloff in 1908–09, and by Sir Aurel Stein in 1913–16. Sir Aurel believed that the site corresponded with Polo's " City of Etzina " (cf. *G.J.* 48, 197), but here is the place with its name " Carachoto " (though misspelt " Charachoco " by the copyist).

There are many minor points which Prof. Benedetto has cleared, such as the name of Polo's chronicler, definitely settled as " Rustichello," and not " Rusticiano " ; and disposing of the legend of the extempore dictation of the book, etc. From the material collected he has also drawn inferences on the diffusion of the book through the centuries.

In the second half of the volume is printed the " geographical text " for the first time philologically correct ; and alongside with it every item and element from the other texts which completes it, given in the original words and language, and with scrupulous reference to the sources. So all the pieces of the puzzle are there, ready to be put into place in the general scheme. The amount of toil and minute discrimination, of knowledge and ingenuity, which must have been poured into the work can only be surmised.

The City of Venice and the Italian Geographical Committee, under whose auspices the book has been published, deserve, with the author, the highest praise for the completion of this task, the most important contribution that has been made for a long time to geographical studies. It does not seem rash to foresee that Prof. Benedetto, after this exhaustive documentation, will complete his work by preparing a unified text from the collected materials, and

turn it in this unified form into modern language. The completion of the second stage also requires a philologist who will give every guarantee of a correct interpretation of the texts. No person could be more competent for this work than Prof. Benedetto, who in all these years of labour has certainly acquired a unique knowledge of the whole subject down to its smallest details.

F. DE F.

THE REGENERATION OF TRIPOLITANIA

LA RINASCITA DELLA TRIPOLITANIA: Memorie e studi sui quattro anni di governo del Conte Giuseppe Volpi di Misurata. *Milano: A. Mondadori* 1926. 10×7 *inches;* xxvii+586 *pages; portrait, maps and illustrations*

THE purpose of this volume is to inform public opinion in Italy on the great work done in Tripolitania during the governorship (1921–1925) of Count Volpi, the present Minister of Finance. It is therefore natural that the general tone should be optimistic, but the optimism is generally well restrained and seems justified by the statistics placed on record. The main text is the work of some twenty-eight contributors, and as each expert has made an exhaustive study of his subject, some repetition is inevitable in those articles which deal with the colony's resources.

Part I. The Country. This contains six descriptive articles, of which the last four are the most important.

Dealing with " The Races of Tripolitania " Prof. Béguinot provides a useful summary, illustrated by two maps, of the origin of the Berbers and of the various invasions into this region in the course of its long history. The map on p. 32 represents the view of Bertholon and Chantre, based on anthropological measurements made in Algeria and Tunisia of several thousand individuals, of which, however, only a very small minority were natives of Tripoli. According to these investigators, the population of Tripolitania is overwhelmingly Berber ; there are no true Arab groups, only a few sporadic individuals. The other map, p. 40, represents the view based on tradition, history and racial customs, which the writer thinks will prove correct. Three distinct groups are recognized : (1) *Berbers*, in language and customs (24 per cent.) ; (2) *Arabo-Berbers*, *i.e.* Berbers who have adopted Arab language and customs (31 per cent.) ; (3) *Arabs*, practically unmixed (36 per cent.). A small minority (9 per cent.) are either Jewish or Negroid.

Prof. A. Trotter's " General Physical Description " gives a clear account of the peculiarities of the Jefara, backed by the Jebel ridges which in turn sink southwards to the Saharan valleys and depressions. Like the first two, more popular, articles it is illustrated by many excellent panoramas and other photographs.

" Climatology " is dealt with by Prof. Eredia. The various tables, the rainfall and mean temperature charts are concisely analysed to bring out the characteristics of the climatic regions and their natural vegetation.

The " History of Tripoli," by Prof. Micacchi, is an excellent summary of the chief historical events from early Phœnician days to the Italian occupation in 1911. A few well-selected photographs of monuments of various periods are given with reproductions of old maps of Tripoli.

Part II. The Conquest of Tripolitania. The Turkish vilayet of Tripoli was occupied by the Italians in 1911 and transferred to the crown of Italy by the Treaty of Ouchy, 1912. The progress of the military pacification of the interior was rudely interrupted by the outbreak of the Great War ; indeed, by the end

of 1915, the Arab insurgents had effaced all vestiges of the foreign occupation except from an area of some 580 sq. miles along the northern coast (see map facing p. 176), where a small garrison behind barbed wire protected Italian officials, scientific investigators whose work still went on, merchants and loyal Berbers. This state of affairs lasted until 1922.

The first two articles refer to various phases of Italian politics, and do not therefore concern us. The rest of Part II deals with the military operations of 1922–25. The whole course is clearly described and illustrated by admirable sketch-maps which, together with the maps facing pp. 176 and 576, enable the reader to follow closely the methods by which over 52,000 sq. miles were reconquered, pacified and reorganized on a stable basis.

Part III. The Regeneration of Tripolitania. This is described in a series of nine articles, all of which bear witness to the profound study not only of Tripolitania but of other regions where similar conditions prevail. In the course of a short review, it would be impossible to give a reasoned account of these monographs : each deserves careful study. In the first " The Policy of Colonization," Count Cavazza discusses the principles adopted, firstly, to safeguard the interests of native proprietors and yet to provide certain areas (see map facing p. 200) suitable for a restricted settlement of Italian farmers; secondly, to assist not only the selected colonists but also the native farmers by financial support and instruction. The other articles deal with Finance, Lines of Communication (illustrated by a map), Education, Justice, Archæological Research (including the excavation and restoration of ancient monuments), Public Works, etc., and Local Government. All the articles are admirably illustrated by well-chosen photographs, diagrams and maps.

Since 1921 the City of Tripoli has been absolutely transformed. Even in the native city abundant water has been laid on and considerable progress has been made with a drainage system. Without destroying any ancient building that was worth preserving, a new European quarter (see map facing p. 376) has been built, with splendid wide streets along which are spaced official buildings, banks, theatres, churches, dwelling-houses and flats, hotels with all modern conveniences. The harbour covers an area of 1200 acres, deeply dredged and protected by breakwaters and magnificent stone-faced quays, with spacious warehouses and all the modern appliances for the rapid discharge and loading of large or small ships. Less than five years ago, only the smallest vessels could reach the old landing piers ; all other operations required launches and barges to and from the anchorages !

Part IV. The Bases of the Future. This consists of five articles, the last four of special interest to geographers.

In the " Development of Agriculture " Prof. E. de Cillio gives in a condensed form the results of his five years' devoted work (1914–1919) as Director of the Institute of Agriculture at the Experimental Station of Sidi el Missri. An excellent agricultural map and a large number of panoramic photographs give an extremely clear idea of the three zones of the Jefara. Throughout this region the soil is predominantly of æolian origin. Only some 40,000 acres lie on water-bearing strata ; the remainder, some 17,000 sq. miles, is mostly true steppeland dependent on the rains and varying greatly in aridity, but partly covered by shifting sand-dunes, *sebka* (salt lagoons) and stony or rocky surfaces. Much of the non-irrigable land produces excellent barley, some wheat, also date-palms, olives and other xerophytic fruit-trees. Moreover, large areas here and on the plateau, are suitable to sheep and goats and certain areas to cattle.

There is no possibility of indiscriminate colonization by Italian labourers, moreover native labour is amply sufficient for the various harvests. At best there will only be room in the Crownlands available (see map facing p. 200) for some 100,000 carefully selected Italian farmers and their families who are prepared to cultivate intensively the irrigated areas. All the rest must be left to native farmers, whose methods are well suited to the climate.

In an article " Maritime Commerce and Credit Banks " Prof. Arias analyses the principal exports and imports and shows the effect of the substantial preference enjoyed by articles of Italian origin. He also traces the causes of the decay of the once flourishing caravan trade across the Sahara. It is suggested that there may be a partial recovery in connection with the natron deposits of Fezzan, but another expert (p. 505) is far less optimistic. The remarkable growth of the banking and allied businesses seems to point to a great stride towards prosperity during the last five years.

" The Industrial Problems of Tripolitania," by Dr. E. Niccoli, opens with a brief summary of the agricultural situation. Date palms are very numerous and productive, and with proper organization should give rise to a large industry in preserved dates and date flour, besides the production of alcohol. Barley and Beer, Henna, Castor-oil, Tobacco, Esparto (for paper and cellulose), and Silkworms are the basis of industries capable of large extension. The intense summer heat is being utilized to concentrate the liquor of various *sebka* which already supply the valuable salts of potassium and magnesium, besides common salt. The Tunny and sponge fisheries, both of ancient date, are only now reaching flourishing conditions.

" Animals and their products " are the subject of the last article, in which the following subjects are discussed in some detail: The best means of providing (*a*) pasturage, by the introduction of new plants suited to arid conditions; (*b*) an increased supply of drinking-water; (*c*) improved strains of cattle for meat and hides and for milk; and of sheep and goats for wool and hair. From time immemorial hides and wool have been an important source of revenue to Tripoli, and before long animal products will probably take first place in the economy of Italy's greatest colony.

The Appendix consists of three interesting articles: (1) The History of the Castle of Tripoli, with many photographs and reproductions of old maps; (2) The Museum of Tripoli; (3) The methods adopted in Roman times for storing and distributing water. B. B. D.

AGRICULTURE IN THE DECCAN

THE AGRICULTURAL GEOGRAPHY OF THE DECCAN PLATEAU OF INDIA. By ETHEL SIMKINS. Supplement to *The Geographical Teacher*, No. 2. *London: George Philip & Son Ltd.* 10×6 *inches*; vi+92 *pages*; 28 *maps and graphs*. 5*s*

THIS is the second number of a proposed series of supplements to *Geography*, formerly *The Geographical Teacher*. The series is intended to include "detailed studies relating to particular localities, provided they have sufficient general bearing." Miss Simkins, who has had the advantage of access to authoritative and first-hand sources of information, and the advice and assistance of acknowledged experts, has brought together a mass of facts concerning the soils and crops of the Deccan, and has studied them in their relation to one another, and to relief and rainfall. She has studied the influence of its geography upon the human life of the region, and the changes brought about in its rural economy by historical causes, by the improvement of communications, and by the development of industry and commerce. Attention is drawn to the effect upon the welfare of the peasant of the minute subdivision of holdings, of fragmentation—the separation from one another of the parts of the same holding—of indebtedness, the compulsory spells of idleness due to climate, the bad conservation of cattle, and the wasteful use of manure as fuel. The prospects of improvement through co-operative societies, better seeds, better cultivation, and better management are considered. Altogether Miss Simkins has given us a convincing study of cause and effect in geography, and the special interest now being taken in the problems of Indian agriculture makes it of very real value.

The Deccan (=Southland) of this monograph is described as a tableland some 2000 feet high, comprised between the Western and Eastern Ghats, and extending from the Satpura highlands in the north and the Mahanadi–Godavari water-parting in the north-east, to the Nilgiri hills in the south. It thus includes considerable areas of importance for the subject-matter of this study which are below 1000 feet; the broad valley of the Purna in Berar, and the Wardha (*not* Wharda) and Wainganga valleys in the Central Provinces. The tableland proper rises south of the Berar–Nagpur high plains, and the railways leading to the Bombay–Hyderabad Deccan use the Manmad pass in the Ajanta range, a range which bears much the same relation to the tableland as the Grampians do to the highlands of Scotland.

Partly because of its comparative geographical isolation the Deccan is one of the most interesting subdivisions of India, though it is not, as stated in the publishers' prospectus of this series, "one of the most fertile regions of the world." What is of most general interest in this study is the way in which the striking differences between the two well-marked divisions of the Deccan, and the consequences of these differences, are brought out. There are differences in scenery, natural vegetation, and animal life, in their characteristic agricultural products, and in the racial affinities of the population. The North-Western Deccan is a land of bare undulating plains, flat-topped ranges of conspicuously terraced hills, and little forest. The soils are generally dark in colour, overlying relatively recent volcanic rock—the Deccan trap, though the most famous of these soils, the "black cotton" soil, is by no means exclusively confined to this formation. These soils are retentive of moisture, and favour crops not requiring artificial irrigation. Hence millets are the chief food crops, especially the Great Millet, whose stalks provide invaluable cattle fodder in a region where woodland grazing-grounds are scanty. Commercial crops of cotton and oilseeds

are the outstanding feature of the rural economy. In the Eastern and Southern Deccan the rolling plains are broken by granitic masses that spring abruptly from the surrounding country, forming dome-shaped hills, fantastic boulders, and tors. The soils, generally overlying ancient crystalline rocks, are mostly reddish, and are suited to crops requiring artificial irrigation. The topography of the country favours the formation of irrigation reservoirs (tanks), which are so numerous that they were indicated, with German thoroughness, in the Sydow-Wagner school atlas. Hence the most important crop is rice, with millets on the poorer lands as the food of the poorer classes. There has so far been little development of commercial cropping.

To the fact that in one division of the Deccan commercial crops are predominant, and in the other division food crops, Miss Simkins ascribes certain differences in the aggregation of population in towns and villages. She also claims a much greater density of population for the rice-growing areas, especially in the eastern part (Telingana) of the Hyderabad State as compared with the western part (Marathwara). But this is not strikingly obvious from the population density map, and Miss Simkins's figures for population density (Telingana 234, and Marathwara 420) would seem to be wrong. The density for these divisions in the 1921 census was 146 and 155 respectively, and in 1911, 161 and 163; and the 1911 Census Report for the Central Provinces remarks that variations in rainfall and crops have had less effect upon population density than the physical characteristics of the country and its past political condition. Much the same density of population is found in tracts where rainfall varies greatly and where different crops are grown. Indeed, the 1911 Census Report specifically says that the advantages derived in Telingana from its high rainfall and rice cultivation are counterbalanced in the other division by the more open country and the rich black cotton soil of a large part of it. Nevertheless, it does seem to be true for India generally that in most of the more densely populated tracts rice is the predominant crop.

A careful comparison of the maps provided is necessary for the full appreciation of Miss Simkins's monograph. This would have been easier had lines of latitude and longitude been given, and if the principal rivers and towns had been shown and named, which would have been possible in most of the maps without detriment to their special object. A further drawback to the convenient study of the paper is that references are made in the text to geographical features which are not given in the maps, and which can only be identified by consulting a comparatively large-scale atlas. W. H. A. W.

REVIEWS

THE EARLIER INHABITANTS OF LONDON. By F. G. PARSONS. *London: Cecil Palmer* 1927. 9×6 *inches;* 240 *pages;* 10*s* 6*d*

It is difficult to say why this title was chosen for this book, the greater part of which restates a thrice-told story about the different races which may be traced in our country from palæolithic times to the end of the Danish régime. The author has been able to examine a number of skulls and bones, is interested and skilled in cranial and cephalic indexes, and sets out to state the little that is known to history from the point of view of the anthropologist. It is not till page 150 that he really begins to envisage London facts, which start with the defeat of Boadicea, and which everybody knows from that time to the reign of Knut to be very sparse indeed. There are interesting passages and summaries which will be useful to the inexpert, and we are glad to recognize that the author is cautious about evidence from skulls, pronouncing it "almost impossible for craniologists to be dogmatic about any one particular skull." But as the results from craniology prove to be almost entirely negative, the book seems hardly justified, especially as it is marred by a great number of inaccuracies. Such spellings as siezed, acustomed, crystallizing; such an array of unnecessary or misplaced or omitted commas as could easily be exemplified; non-hyphened compound adjectives such as black haired, brick earth covered (hills), and so on; or such an error as (p. 183) "The *Notitia Dignitatum*, an itinerary with mileages between the Roman stations"—these are only types of the mistakes disfiguring the work. The author blandly accepts the "Pretorium, so lately discovered on Cornhill." Braintree and Dunmow (p. 157), where the order is important, should be Dunmow and Braintree; and Aylesford and Crayford (p. 185), for the same reason, should be Crayford and Aylesford. The book, in short, is mostly restatement garnished here and there with a little fanciful conjecture, but making no firm-based new contribution to our knowledge of the earlier inhabitants of London.

S. E. W.

BRITISH ASSOCIATION LEEDS MEETING 1927: General Handbook edited by C. B. FAWCETT. *Leeds: For the Local Committee by Chorley and Pickersgill, Ltd.* 1927. 7×5 *inches;* vii+288 *pages; illustrations and diagrams, and two maps in separate case*

The Handbook issued last year in connection with the visit of the British Association to Leeds marked something of a new departure in the series of such publications, which in the past have been of very varied character both as regards form and subject-matter. We believe that the effort to introduce a more uniform and systematic plan into the preparation of these handbooks was largely due to Prof. J. L. Myres, one of the General Secretaries of the Association, who suggested that though primarily intended for a B.A. meeting, such handbooks might be so planned as to serve as text-books for regional study, while their preparation might arouse a keener interest in local features and activities in advance of the actual meetings. In course of time the whole country might be covered by a series of such volumes, approximating to a standard format and in their main features following the pattern set by the best of the previous handbooks.

The editing of the Leeds handbook on these lines fell naturally to the Head of the Department of Geography in the local University, Dr. C. B. Fawcett, and many of the separate sections were contributed by his colleagues or by responsible members of the City Administration, so that the handbook speaks

with no lack of authority. The volume is rather below the average bulk, but the scale is adequate to display the main features without over-elaborate detail. The section on Botany is provided with a careful bibliography which makes it easy to follow up any part of the story in detail—an example which might have been imitated by other contributors. The sketch-maps and diagrams in the text are supplemented by folding maps of the district based on the Ordnance and Geological Surveys.

It has sometimes been suggested that greater uniformity of treatment might be secured if the preparation of the handbooks were undertaken by the Association itself, not by the local committees; but it is clear that the greater part of the compilation must in any case be done by local experts, while any drawback arising from variation in treatment is amply set off by the stimulus to local interest afforded by leaving the task to be done on the spot—such stimulus being an important element in the visits of the Association.

Dr. Fawcett and his coadjutors are to be congratulated on the success achieved last year in the desired direction.

COAL IN GREAT BRITAIN. THE COMPOSITION, STRUCTURE, and Resources of the Coalfields, Visible and Concealed, of Great Britain. By WALCOT GIBSON, D.SC., F.R.S. *London: Edward Arnold & Co.* 1927. *Revised and enlarged edition.* 9×6 *inches;* viii+334 *pages;* viii *plates and* 53 *illustrations.* 21*s*

The need for a second edition of this book, first published in 1920, indicates that it has fulfilled its purpose in supplying a "concise account of the geology of coal generally and of the coalfields of Great Britain in particular." The present edition is enlarged by the addition of a chapter of thirteen pages on the origin and composition of British coalfields, but is otherwise substantially the same as the original. The criticisms which were levelled against the first edition therefore apply equally to the present one. Written for "mining engineers, mine owners and mining students," we doubt whether much of the main part of the work would be intelligible to any one who had not a good working knowledge of geology. If the first seven chapters are intended to supply this knowledge they can only be regarded as inadequate, and they compare unfavourably with such a clear concise introduction as that given by Dr. F. J. North in his 'Coals and Coalfields in Wales.' Thus the very elementary remarks on structure on p. 75 contrast curiously with the complicated examples given on p. 76 and p. 90. In three and a half pages of text an attempt, obviously doomed to failure, is made to give a description of the distribution in space of the world's coalfields. Assuming, then, that the book is to appeal to those already versed in the elements of geology, it is regrettable that it contains no references to literature and rarely mentions even the names of the workers whose results are quoted. The book is thus dogmatic and passes over the majority of disputed points. It is disappointing, too, to find recent work rather completely ignored in many places. Thus the description of the East Kent Coalfield remains almost word for word the same, and no notice whatever is taken of progress since 1920.

It is inevitable, from the author's long association with the Geological Survey, that the book should be in large measure a summary of the detailed memoirs published by the Survey, to which it may be regarded as a useful introduction.

L. D. S.

A TOUR THRO' THE WHOLE ISLAND OF GREAT BRITAIN. By DANIEL DEFOE. With which is Included, A Set of Maps of England and Wales, divided into counties; and a Map of Scotland, composed by HERMAN MOLL. With an introduction by G. D. H. COLE. 2 volumes. *London: Peter Davies* 1927. 10×6 *inches;* xxxii+416, viii+417 *pages; maps.* £3 3*s*

"Cirencester, or Ciciter for brevity, a very good town, populous and rich, full of clothiers, and driving a great trade in wool." This, by reason of both what Defoe says and what he leaves unsaid, is a perfectly typical entry in his account of what he saw in his circuits in England and Scotland in the years 1724, 1725. and 1727. He sets out to observe the present state of commercial production in the towns and to record it in the plainest of styles. Of antiquity he makes but the most cursory note, if any note at all. Imagine a guide-writer of to-day dismissing Cirencester without a word about its Roman mosaic pavements or the lore by which Mr. St. Clair Baddeley nowadays draws so many to the town. Now and again, however, he "gives the loose" to his pen, digresses from his main purpose, and dwells at length on odd circumstances which for some reason or other interest him. Thus, on reaching Colchester, he naturally starts with the "Bay" trade of the town, the spinning of wool for it in the neighbouring country, and its European markets, especially Portugal and Italy; but he is presently deep in an account (fourteen pages) of the siege of the town in 1648, because he had acquired a manuscript from a reliable authority. Of Chichester he can find little to say except that it now manages its corn trade well, sending flour to London by sea; but he launches out into a lively narrative of how some big stones were wrenched out of the Cathedral spire by lightning. In Surrey also he is absorbed by the subject of the "swallows" of the Mole near "Darking." On the whole it is a delightfully easy, chatty account of men and places, with a wealth of details (not always *facts*) which make his pages a good supplement to modern Guides by way of a retrospect of just two centuries. The publisher is to be commended for his enterprise in rectifying a somewhat extraordinary omission, namely, that this is the first re-issue of the 'Tour' since 1778. To-day interest certainly tends Defoe's way. He is a keen observer of significant contemporary facts, especially economic and social. "The Tour," says Mr. G. H. D. Cole, in his excellent introduction, "shows Britain through a tradesman's eyes. But it is the sale and marketing of the product rather than its manufacture that commonly attracts his attention." Thus he does not describe the methods—for this we have to go to Sussex archæologists—of the Sussex iron-works, and, incidentally, he seriously underrates the future effects of the vast consumption of timber for fuel. Still, the 'Tour' is full of good matter: "its very plainness and the humble purpose it was designed to serve give it a special value as a work of historical record." Of course his method is very selective: thus in Sussex he deals only with Lewes, Brighton, Shoreham, Steyning, and Bramber, Arundel, Petworth, and Chichester. But for a short list his choice is sound. Sandwich he calls "an old, decayed, poor, miserable town"; Dover Castle is "old, useless, decayed," with a "good for little harbour and pier." Maidstone on the contrary, is "a town of very great business and trade, and yet full of gentry, of mirth, and of good company." As a guide Defoe is very human. The present edition is well turned out; but the maps of the Dutchman Moll, though clearly reproduced in photographic plates, are so small as to need the help of a glass. It may noted that the date given for Moll's coming to London, in which Mr. Cole follows the D.N.B., is certainly too late. S. E. W.

BURGUNDY PAST AND PRESENT. By EVELYN M. HATCH. *London: Methuen* 1927. 8×5 *inches;* x+240 *pages; illustrations and sketch-map.* 8*s* 6*d net*

This book may be commended to all who are interested in one of the most interesting parts of France. The author writes with insight, sympathy and knowledge, and has obviously taken great pains to be accurate and useful to travellers. The book was planned and partly written by Miss Eleanor F. Jourdain, Principal of St. Hugh's College, Oxford, and on her death the manuscript passed into the hands of the present author. It is not possible to describe the work in detail, but it would be difficult to think of a more delightful companion for the wise traveller who is content to break his journey southwards, and spend a week or so in a district full of historical associations and rich in magnificent churches and stirring memories of great men and mighty deeds.

M. L.

MALLORCA THE MAGNIFICENT. By NINA LARREY DURYEA. *London: Faber & Gwyer Ltd.* 1927. 8×5 *inches;* viii+280 *pages; illustrations and sketch-map.* 12*s* 6*d*

This is a most interesting and attractive book. The author evidently knows Mallorca and its people well, and she writes pleasantly and sensibly on a variety of matters from history to housekeeping. There are chapters on the conquest of the island by the King of Aragon, Religion and Customs, the Palaces of Palma, Raimon Lull, Cathedrals and Churches, Beaches, Country Houses; and the book contains many useful hints for intending visitors. It is interesting to learn that, in this delectable isle, drivers address their beasts in language which smacks of poetry. "Courage, my beloved ones, twin blossoms that you are. Make of your hoofs wings, my angels. Fly! Glory awaits you," sounds so much better than an imprecation, even if the driver's eloquence does not always express his feelings. Pigs, we learn, are cherished like jewels, and no one ever speaks of killing turkeys. Good manners prohibit it. A notice may be hung out announcing: "Here turkeys will kill themselves two days before Christmas," but that is all. The author tells us that in Mallorca rheumatism, asthma, sciatica, arthritis, and other ills of the flesh depart as if by magic, and that a good average for a year is 43 wet days and 170 cloudy ones. During the rest of the time the sun shines brightly and fur coats are never needed. It is not to be wondered at that one reader, at least, after closing this book is sadly out of humour with London in winter. The illustrations are excellent. There is a sketch-map and a useful index.

M. L.

A MAJORCA HOLIDAY. By ADA HARRISON, with drawings by ROBERT AUSTIN. *London: Gerald Howe Ltd.* 1927. 9×6 *inches;* viii+228 *pages; illustrations and a map.* 12*s* 6*d*

This charming, cleverly written book does wholly what it sets out to do, namely to describe the impressions of a writer and an artist who, in true holiday spirit, visit Majorca and "willingly waste their time in it." The sights and people of Palma, the caves of Manacor, Pollensa, Alcudia, Lluch, Deya, and Valldemosa, and the ways of the folk who dwell in them, are vividly portrayed. What more tantalizing than in mid-December to be sitting here in England with semi-frigid back, in spite of the wood fire in front, and reading of the February sun and warmth and slow-passing time in Majorca? As the author writes: the state ". . . of sometimes sitting and thinking and sometimes just sitting—a state as rare in London as a return to the golden age—can be recaptured here without an effort, and lapped up like ambrosia. . . . One sits for an age warmed through

by sun and a sweet formless sensation of thought . . ." Mr. Austin's crayon studies and line drawings are vigorous and helpful illustrations of a text which makes one of the most delightful holiday books we have ever read. This is mainly due to the lively descriptive style of the author. It is alert, full of variety, tinged with a quiet humour, and rich with the resources of an ample vocabulary.

S. E. W.

THE MEDITERRANEAN AND ITS PROBLEMS. By MAJOR E. W. POLSON NEWMAN. *London: A. M. Philpot* 1927. 9×6 *inches;* xiv+330 *pages; illustrations and maps.* 16*s*

A considerable part of the material of this book has been published previously in periodicals and newspapers, the author having acted as a special correspondent in Mediterranean countries. Major-General Lord Edward Gleichen, who contributes a Foreword, states that the mainspring of the book is the problem of over-population in Italy, and the need for finding an outlet for the surplus population there, now that the United States are largely closed to Italian emigrants. A similar statement is made in the author's preface, where it is said that Italy's rise to power and need for expansion constitute the gravest Mediterranean problem, and that the future peace of Europe depends largely on Mediterranean considerations. But in the book there is no serious discussion of the extent to which Italy is over-peopled, nor do we find any definite suggestion as to the direction which Italian expansion is likely to take, or should take. The chapter entitled "Glimpses of the Levant," with parts of those on Egypt, seems to have no particular bearing on this problem, or indeed on any political problem. The style also is careless and frequently inelegant, and the author's habit of constantly interpolating quotations, sometimes very long ones, from others or from his own writings, is very irritating. But if the book does not make a very direct appeal to the geographer, and can scarcely be called a profound study of Mediterranean problems, it is of value in drawing attention to the changes in outlook so characteristic of many of the Mediterranean peoples in the post-war period.

M. I. N.

PAGES FROM HERE AND THERE IN SERBIA. By LENA A. YOVITCHITICH. *Belgrade: S. B. Cvijanovich* 1926. 8×5 *inches;* xiii+169 *pages; illustrations.* 3*s* 6*d*

This attractive little book consists of a series of articles most of which have been previously published in periodicals. Their author is of mixed Serbian and Scottish descent and has spent much time outside her native land, so that, though an intensely patriotic Serb, she can look at her country with a certain degree of detachment. A number of the articles are devoted to Serbian customs and history, Belgrade in the post-war period, and so forth, but there are also accounts of excursions to different parts of Yugoslavia. A vivid description of a journey through Bosnia and Herzegovina to the Dalmatian coast, written in 1923, is particularly interesting in that it shows—as indeed was to be expected—that this region presents as novel an appearance to a Serb of Belgrade as to an inhabitant of Western Europe. The statement that in the year named 40,000 visas were issued to Czechs proposing to visit Dalmatia is worth note.

CONSTANTINOPLE (AZIYADE). By PIERRE LOTI; translated by MARJORIE LAWRIE. *London: T. Werner Laurie* 1927. 9×6 *inches;* 266 *pages.* 10*s* 6*d*

No one would take up this book expecting to find a detailed description of Constantinople. It is a curious, dreamy miscellany, half autobiography, half romance, and not perhaps in Loti's best manner. The effect upon the reader

is to leave him a little tired and bewildered at so much self-examination, so many sobs, and such detailed love-making. There is some fine descriptive writing which one cannot but admire, and the translation is well done. The second fragment, "Fantôme d'Orient," published in 1892, another curious study of life in Constantinople, has been added to the longer work. The preface states that Loti could at times be incredibly bored. He could also be not a little boring. M. L.

L'ESTONIE. (*La Revue Belge d'Importation et d'Exportation. Avril* 1927.) *Brussels: J. Lebègue et Cie.* 13×10 *inches;* 124 *pages; illustrations and maps. Fr.*40

This number is devoted to an admirable review of Estonian activities, embracing not only economic and industrial matters, but also history and the arts. Each article is written by an Estonian authority, and is both comprehensive and informative; particularly illuminating is the section devoted to Co-operative societies, which have developed enormously in the past twenty-five years. The maps are good, and the one showing how Estonia is connected with the rest of Europe by rail and steamship route is especially useful. O. R.

NOTES ON THE PHYSICAL GEOGRAPHY OF BENGAL, 1764–1776, from the writings and maps of Major James Rennell. By Lieut.-Col. F. C. HIRST, I.A. 2 volumes. *Calcutta: Bengal Secretariat Book Depot* 1926. 13×8 *inches;* 101 *pages;* 17 *illustrative maps separately.* £6

In 1917 Colonel (then Major) Hirst published a Memoir on the Surveys of Bengal by Major James Rennell in 1764–1777, accompanied by a portfolio of fifty-eight large plates of reproductions of Rennell's River Surveys and maps from the originals in the India Office, the existence of which had been known to but few. He has now amplified this important work by publishing photographic enlargements to the scale of 4 miles to the inch of such of Rennell's 5 miles to the inch plates as practically cover the whole of the present province of Bengal. In the case of Plate IX (Chittagong) the original scale of 3 miles = 1 inch has been retained. By the use of colours and signs he has incorporated information as to the navigability of the rivers in Rennell's time, depressed and elevated areas, roads, rough limits of tidal action and areas subject to annual inundation. This information, which is discussed at length in the Notes, has been collected with much labour from Rennell's own maps and records, including his 'Diary' (1764–67), his 'Description of the Roads in Bengal and Bahar' (1778), his 'Memoir of a Map of Hindoostan' (the first edition of which was issued in 1783, not 1788), and from a 'Map of the Inland Navigation,' with 'Tables of Routes and Distances through the Principal Inland Navigations,' and an explanatory introduction called 'Advertisement,' that appeared in the issue of the 'Bengal Atlas' that was published early in 1781. A note in a subsequent issue of the 'Atlas' in the same year tells us that this matter concerning inland navigation had been "bound up by itself, in Quarto." In para. 5 of his Notes Col. Hirst possibly refers to this quarto volume.

The Notes deal chiefly with the rivers—a vast and fascinating subject, having regard to the ever-fluctuating courses of most of them, and the importance of these changes from the geographical and historical, as well as administrative, points of view. A glance at a modern map of the province by the side of Rennell's sheets reveals at once the remarkable changes that have taken place in the channels of most of the big rivers since Rennell left India, just 150 years ago. The main channel of the Brahmaputra, for instance, now runs about due south from below Chilmari, instead of round by Maimansingh and Bhairab

Bazar, as in Rennell's day, the two courses being nearly 70 miles apart in one place. The once important Karatoya, probably swollen in early times by other Himalayan rivers that now follow variable courses of their own, has dwindled down to an unimportant stream. The Tista, which in Rennell's time flowed almost due southwards through the Dinajpur and Rajshahi districts to the Ganges, now turns off to the south-east below Jalpaiguri (more or less following Rennell's " Teesta Creek "), and joins the Brahmaputra in the neighbourhood of Chilmari. The Kosi, though it has moved comparatively little since Rennell's day, has continued that remarkable westward trend, noticeable in the case of several affluents of the Ganges, for which different causes have been suggested. The course of the Jalangi has widely altered ; the main channel of the Ganges itself has changed in numerous reaches ; while the Ichamati, down which Tavernier travelled in 1666 from near Jafarganj to Dacca, which was silting up even in Rennell's day, now contains scarcely any water during the dry months.

It is almost impossible in these days of rapid transit by rail, launch and motor, to realize the physical difficulties involved in the work carried out by Rennell and his small band of assistants in a country like Bengal as it then was, intersected by networks of rivers, largely overgrown by jungle and with but few roads worth the name—not to mention his well-nigh fatal encounter with Sannyasis in Kuch Bihar in 1766. It was under these conditions that were laid the foundations of accurate topographical survey in India, and were ripened those powers of observation and judgment that were to earn for James Rennell his pre-eminence among British geographers. C. E. A. W. O.

THROUGH JADE GATE AND CENTRAL ASIA : An account of journeys in Kansu, Turkestan and the Gobi Desert. By MILDRED CABLE and FRANCESCA FRENCH. *London : Constable & Co. Ltd.* 1927. 8×5 *inches ;* xvi+302 *pages ; illustrations and sketch-map.* 10*s*

This is one of the best books of travel of the time. The writers—two of three missionary ladies whose journeys are described—covered no new ground ; but they describe old ground with a new felicity. And what is of real value, they describe the present condition of remote parts of China and Siberia with such fairness and clearness that we feel we can actually see what is going on there.

And those conditions have changed vastly for the worse so far as travellers at least are concerned. Thirty or forty years ago there was no special difficulty in a traveller journeying, like these ladies, from the heart of China to Kansu and across the Gobi Desert to Turkestan and thence home through Siberia. But in these days of brigandage and civil war it is no mean feat. And what one admires in the narrative is the courage and good humour and good sense which these ladies displayed. Little is said about what must have been the really dreadful conditions of travel—especially for ladies—in crowded and filthy Chinese inns which the state of the country must have produced. And avoiding the common habit of travellers of spending most of the space when writing a book with accounts of their annoyances, these writers have devoted their pages almost exclusively to sympathetic description both of the country and the people.

It is a sad picture they paint. And it is melancholy to think how greatly the prestige, not only of the Russians but with them of all Europeans, and not only of Europeans but of the Chinese themselves, has fallen of recent years. The Chinese have lost not only respect for Europeans but respect for themselves. Law and order are gone. And the further one proceeds with the book the more revolted is one at the horrible messiness of things. It reads like a nightmare. There is a haunting sense of horror all round.

Yet through it all one catches glimpses of a very kindly and courteous people deserving of a better fate than this—and a people who in the midst of their misery never failed in showing gratitude to three heroic women who had devoted their lives to the welfare of China. F. E. Y.

CHINA AND FOREIGN POWERS: An historical view of their relations. By Sir FREDERICK WHYTE, K.C.S.I. *Published under the auspices of the Royal Institute of International Affairs. Oxford: University Press* 1927. 9×6 *inches;* viii+78 *pages.* 2*s* 6*d*

This is a most valuable brochure for every one interested in the political situation in China. No such compact or reliable statement exists elsewhere. It is published under the auspices of the Royal Institute of International Affairs, and was prepared by the author before he and his colleagues went to Honolulu to attend the Conference called by the Institute of Pacific Relations for July 1927. In thirty-eight pages the author presents the subject under five heads, and adds forty pages of useful appendices containing an Extract from the Mandate of Chien Lung to George III. in 1793; the Despatch of Lord Palmerston to China in 1840; an Extract from the Memorandum of the Chinese Delegation to the Peace Conference 1919; the Ten Points submitted by the Chinese Delegation to the Washington Conference 1921; the British Memorandum of 18 December 1926; part of Sir Austen Chamberlain's speech of January 1927; the British Government's communication to the League of Nations, January 1927; the Hankow Agreement of February 1927; Sun Yat-sen's Will, and a Summary of his doctrines; and the Programme of the Cantonese. The five headings of his own statement are The Period of Foreign Exclusion to 1793; of European Admission to 1861; of European Aggression from 1873; of Chinese Revolt from 1900; and The Main Features of British Policy.

The author recognizes that the periods are somewhat arbitrary. Certainly his attempt to sum up the first period in a page and a half almost forbids criticism. It may however be disputed that China was ever exclusive until the eighteenth century, or that "the West had nothing to offer to China in exchange for Chinese products"; but the statement that Trade, and not territorial aggression, was the sole motive of Great Britain, from which it has never willingly departed, is one that deserves the emphasis the author lays on it.

In his appraisement, on p. 9, of "the shrewder Chinese, among them Yuan Shih-kai," for realizing that the Emperor's "rescripts of reform were not reform itself," he is scarcely fair to the unfortunate emperor, for Yuan was one of the reformers, and his conduct towards the Emperor, his own fellow-reformers, and the Republic, have led to his being considered as a traitor to them all. The value the author places on the Anglo-German agreement of October 1900 for preventing the partition of China is justifiable.

The reasons he gives for the "mis-called 'Opium War'" on p. 34 hardly survey the situation sufficiently. There are other views than the one he states that "we pressed our claim to trade with China to the point of war," or that "we fought the First China War in order to open the closed doors of China to our merchants." The war was in fact fought, as shown in Lord Palmerston's letter in Appendix II, in defence of the Royal representative, and of British traders with their wives and children, who, after fleeing for shelter from attack, were in peril of their lives in what is now Hong Kong harbour. At the end of the so-called war, the Chinese Government was left as free as ever to suppress opium, a course in which the British Government would willingly have rendered assistance. The author makes it clear that "other nationals did not fail to

profit by our action, leaving us to bear the brunt of the opium "—in which unhappy trade they were also fully engaged.

The summary of Dr. Sun Yat-sen's "Three Principles of the People" is misleading, inasmuch as it omits the essential elements of that book, which is now a school-book in every Nationalist school, propagating its reiterated hatred of this country, and its enthusiastic support of Russian Communism. The author is not responsible for the Summary.

With these few criticisms this book may be most heartily commended to every one interested in the great geographical unit of China. W. E. S.

MALAYA: An Account of its People, Flora and Fauna. Major C. M. ENRIQUEZ. *London: Hurst & Blackett Ltd.* 1927. 9×6 *inches;* xvi +303 *pages; illustrations and maps.* 21*s*

Major C. M. Enriquez has attempted too much in his latest book on the Malay region. To begin with, he sets out to give a connected historical account not only of the states and islands which are officially known as British Malaya, but of the whole of the Dutch East Indies and of Borneo as well. Adequately treated, such a book would be gigantic, but in addition to this Major Enriquez describes the people and the flora and fauna of Malaya. The two chapters which deal with the flora and fauna are well done and valuable: here the author is on his own ground. Elsewhere he is on other authors' ground, and in his historical sections, which form by far the greater part of the book, there is scarcely any information which is not to be found elsewhere, and though he quotes freely, his sources and authorities are often not given and are sometimes given incorrectly; there is no bibliography (a serious omission in a work of this kind); and such a work surely deserves a better map than one (showing the Peninsula alone) of 50 miles to the inch, reduced so that many of the place-names are indecipherable.

The truth is that Major Enriquez, who can write delightfully when he chooses, has taken matters too easily. His subject has been too vast and his compression too great to give him a chance to produce a book of any real value. What are we to think of an account of Malaya that devotes but six pages to the momentous period of 1896–1926? O. R.

THE PHILIPPINES. By NICHOLAS ROOSEVELT. *London: Faber & Gwyer* 1927. 9×6 *inches;* xii+316 *pages, and maps.* 15*s*

When at the end of the Spanish-American War in 1899 the Philippines fell to the lot of the victors, the Americans took up their new possession with enthusiasm, even perhaps a little light-heartedly. For the firm despotism which, for good or evil, had been the Spanish method, was substituted a benevolent autocracy, tempered with promises of early reward for good behaviour. Every kind of benefit was lavished on the Filipinos, not the least of them being education, of a sort. And it was not long before the results began to declare themselves in a dwindling peasant population and an increasing black-coated clerkly class, the "failed B.A.'s" of another country. Haste and a passion for results have been at the root of most of the troubles of the Americans. The process of rapid Filipinization of the islands began with the appointment of Mr. F. B. Harrison as Governor-General in 1913. The passage of the Jones Law in 1916 completed the Filipinization of the government, with the result that practically all the executive and technical positions which had been held by Americans were turned over to Filipinos. Between the years 1916 and 1921 more than eighty statutes were passed curtailing the powers of the Governor-General. Except the Vice-Governor-General, who is also appointed by the

President of the U.S.A., the members of the Governor-General's Cabinet are Filipinos, whose loyalty and sympathies are doubtful. It was evident that a critical state of affairs was approaching and that something must be done. Fortunately the crisis produced the man—Major-General Leonard Wood, whose premature death occurred last year. General Wood had already long experience of the Philippines, had served his country with distinction in the settlement of Cuba, and it is affirmed that Lord Cromer said that if he had full power to name the man best fitted to untangle the problems of Egypt, he would pick Leonard Wood. The new Governor-General had an uphill and a thankless task before him. His Administration was unceasingly attacked by the Legislature, which demanded "absolute, unqualified and immediate independence." Since the death of General Wood the Philippine Senate has refused to approve several of his more important appointments. No successor to him has yet been appointed, and it may be said that the Administration finds itself confronted by a stone wall.

Mr. Nicholas Roosevelt, as a special correspondent of the *New York Times*, had exceptional opportunities of making a general survey of the islands in 1925–1926. In 'The Philippines' he gives an admirable sketch of the more important problems with which his countrymen are concerned. It was inevitable that he should contrast the results of the Dutch methods in their East Indies with those of the Americans in the Philippines. The problems to be met in the two regions are very much the same; but the Dutch have moved slowly for three hundred years, while the Americans have hastened for less than thirty. Students of international affairs will read with interest the chapters entitled "The Dogs of War," in which the supremely important strategic position of the islands in the event of a Pacific upheaval is clearly shown. The volume is furnished with a small sketch-map, but it lacks an index. A. F. R. W.

SEVEN YEARS IN SOUTHERN ABYSSINIA. By ARNOLD WIENHOLT HODSON, C.M.G. Edited by C. LEONARD LEESE. *London: Fisher Unwin Ltd.* 1927. 9×6 *inches;* xvi+277 *pages and illustrations.* 18*s*

IN THE COUNTRY OF THE BLUE NILE. C. F. REY. With a foreword by Major-Gen. LORD EDWARD GLEICHEN. *London: Duckworth* 1927. 9×6 *inches;* 296 *pages and illustrations.* 25*s*

These two travel books are important contributions to our knowledge of Abyssinia, as the great East African state is generally called by English writers, though it should properly be called Ethiopia, the name by which it has been officially known for some two or three thousand years. The inhabitants resent the epithets Abyssinians and Abyssinia, which are derived from the Arabic *Habesh*, "mixed." The anomaly of calling the country after the Arabic nickname is forcibly illustrated in the forefront of both these books. Mr. Hodson was Consul for Southern Ethiopia, and states (p. 5), "the official name of Abyssinia is Ethiopia"; yet in recounting his travels he discards "Ethiopia" for "Abyssinia." Mr. Rey is conscious of the inconsistency. He writes (p. 31): "They describe themselves as Ethiopians, which ethnologically is certainly incorrect." Here he is wrong: for they alone for countless generations used and preserved the ancient Ethiopic or Gheez (Gîz) language, and the assertion that "Ethiopia" should be confined to Nubia is without justification.

The country, in its present limits, is as large as Britain, France, Belgium and Holland combined (Rey, p. 30), with a population not much larger than that of Greater London. The two travellers covered very different ground. Rey visited the semi-independent kingdom of Gojjam, which James Bruce made familiar to us by his 'Travels to discover the Source of the Nile.' Hodson's

journeys were not really in " Abyssinia," but in the lower-lying regions to the south, inhabited by the Boran Gallas, where the climate is not suitable for the mountaineers of Habesh to reside. It was only some thirty years ago that this country was added to the Ethiopian empire by the Emperor Menelik. Hodson was appointed Consul in 1914 to watch the frontier where Abyssinians had been continually raiding the Borans in the British " sphere " (now Kenya), robbing and murdering the natives and carrying off not only cattle but women and children into slavery. That he was not always received with favour by the local governors is not surprising, and he has much to say of the numerous obstacles which they put in his way. He has much to tell us of the Boran and their country, of the capabilities of which he writes favourably, and incidentally throws some light on the happenings at the capital, Addis Ababa.

Mr. Rey and his wife have paid several visits to Abyssinia, and one of his journeys was described in a previous volume (' Unconquered Abyssinia,' 1923). In this one he recounts his journey to Gojjam, to which, curiously, he assigns a different date from that given in his paper in the *Journal* (June 1926, pp. 481, 484). Both writers, in fact, seem somewhat careless about dates. Mr. Hodson, for instance, narrates events " during the latter half of 1915 " (p. 124) which were reported in *The Times* of 2 June 1914. Mr. Rey does not indicate the purpose of his travels, but, unlike Hodson, he was well received by the Abyssinians ; his experience in that country was always of the happiest ; he never even had a rude word spoken to him, " which is more than can be said of travelling about in post-war Europe " (p. 174).

He gives a summary of the history of the country, and in an appendix prints a chronological table of the sovereigns of Ethiopia from 4530 B.C. (!), given to him by Ras Tafari. This contains many more names—there are 312 in all—than in previously published lists, and is evidently a careful compilation, with dates according to Ethiopian chronology, though it contains discrepancies, which Mr. Rey makes no attempt to clear up. Thus, Del Naad in the list is said to have reigned 910–920 A.D. ; yet the revolution which drove his dynasty from the throne is generally put, as by Bruce, in 960. Perhaps Henry Salt had more reason in dating it 925. In any case, this list of kings is useful in helping to clear up the tangled skein of Ethiopian history. Rey's account of the improvements and progress of the country in recent years is interesting : of Addis Ababa (which he frequently dubs " Addis "), with its three newspapers (two in Amharic and one in French), its school established by Ras Tafari, and its couple of hundred motor cars, of which only one or two per cent. are British. Slavery has not been entirely abolished, and Mr. Rey points out the difficulty of overcoming the prejudices of an old-established institution. Outside the capital the people are unprogressive, largely owing to the influence of the Church, and Ras Tafari meets with many obstacles to his efforts for reform. The country is potentially wealthy and in need of development, but there are momentous problems to be dealt with, and the people are, not without reason, very suspicious of foreigners. Mr. Rey advocates action on the lines taken in Siam (p. 233).

The small sketch-maps in both books are very inadequate, and do not show all the places spoken of, but the many photographs are an excellent feature.

F. A. E.

PRACTICAL ORTHOGRAPHY OF AFRICAN LANGUAGES. *London: The International Institute of African Languages and Cultures* 1927. 8×5 *inches;* 16 *pages.* 6*d*

This little pamphlet, being Memorandum I of the I.I.A.L.C., leaves us somewhat bewildered as to the meaning of the word "practical." If it is desired to construct a system of orthography for the exact phonetic teaching of African languages to Europeans so that they may distinguish all the labiovelars, voiceless lateral explosives, and what not, and be saved from the unpardonable blunder of confusing sounds like the *k's* in *keep* and *collar*, it is, no doubt, necessary to have recourse to symbols not found in our alphabet. But apparently the intention is that all African languages should be habitually written and printed according to the elaborate system set forth here, which includes letters with hooks and loops, long *f* as well as long *s*, Greek epsilon and inverted *c* bearing the tilde, etc., etc. The consonants called Affricate—an unfortunate term to use in connection with the continent under consideration—are allowed to be written in two letters, as *ts;* but *t* with long *s* is to represent the sound of English *ch*, and *d* with a sort of long *z* (or Irish *g*) that of English *j*, in some cases with the alternatives of *c* and inverted *f* respectively. The latter is apparently preferred to *j* (which is not wanted for anything else) "on account of the international use of *j* in the sense of *y*." On the other hand, *x*, which is surely no less internationally used in the sense of *ks*, is to represent the Scottish sound of *ch* in *loch!* And although this alphabet of fifty-seven letters (or combinations of letters) is intended to represent all the shades of sounds or "phonemes" likely to be met with (except clicks and a few other noises not yet dealt with), differences of local pronunciation or "diaphones" in the same language are to be ignored. "Thus Fante speakers of Akan pronounce the syllable *di* as *dzi* and *ti* as *tsi;* but the orthography *di*, *ti* is adequate for covering both pronunciations."

Without stopping to concern ourselves with the fact that all printing presses which deal with African matter would have to be provided with the necessary extra type, we geographers must face the prospect of seeing native place-names written on maps in this strange orthography. If we may judge by the specimen translations of the Lord's Prayer, it would be to the uninitiated not much more intelligible and certainly far less picturesque than the Arabic script in which Hausa and Swahili are sometimes written. We are told that special letters, if properly designed, are no more difficult for an African to learn than ordinary Roman letters. But wherein lies the advantage to the native races in learning this Panafrican alphabet, when their tutelary Powers, whose language it is much more important for them to read than that of their native neighbours, use other alphabets? It is evident that most of the unfortunate natives would have to be taught two kinds of orthography. Are all these things practical?

J. H. R.

THE GLAMOUR OF BRITISH COLUMBIA. By H. GLYNN-WARD. *London: Hutchinson & Co. Ltd.* 8×6 *inches;* xix+238 *pages;* 31 *illustrations and map.* 12*s* 6*d net*

The merits, and the defects, of this work are due to the entire absence of stereotyped information, bad or good; and the author's impressions, though original, are not always correct. The publishers' claim that the book offers reliable information should not be taken literally: it is better described by the title.

The glamour of the coast is wonderfully portrayed in the account of Loughborough Inlet, and its pathos in the tale of Lone Tom Sullivan and his dog

Judy. The author roams at large among salmon canneries, logging camps, and pulp mills, has little to say of conventional city life, but deals briefly with the Vancouver waterfront, and somewhat more fully with Prince Rupert and its fishing industry. She gives a good account of the pulp mill at Ocean Falls and the town of its creation, but is wrong in attributing this plant, in the first instance, to American enterprise, for Link Lake, its source of power, was dammed by English capital.

The tales of early days are interesting but not always easily credible. It is, for instance, hard to believe that few have travelled the Cariboo Road since Nigger Pete drove his team, apparently with sixteen horses, in the days of the gold rush. History north of the 52nd parallel was not marked solely and entirely by the coming of Simon Fraser, but had been initiated by Mackenzie's crossing of the continent. Fort George was by no means the biggest fur-trading centre; the distributing point in the early days was Fort St. James. This post again was not the first established in the province; the honour belongs to Fort McLeod. Tolmie and Dawson should be given credit for early Indian research, as well as Father Morice.

There is some confusion between the Canadian bighorn and *Ovis Dalli*, but the mountains these sheep inhabit are well described. The distant train, like a tiny black centipede manœuvring round the walls of a castle, is made to furnish a lesson in economic geography: "I realized that we were watching one of the epoch-making events of the times—the gradual turning of the golden rivers of prairie grain westward instead of eastward; a change which is bringing the eyes of the shipping world to bear on Vancouver as a grain port."

The watershed of the Great Divide, which formed the Alberta boundary is, we are told, liable to change, but the author cannot understand why the provinces should concern themselves with such a trifle, to the extent of spending millions of dollars in such a desolate region. But title to coal or mineral claims cannot be granted by either government near an indefinite boundary. One can but wonder where all the "millions of dollars" go, with both provincial survey parties "working hard like the industrious creatures they are for very little pay and no glory at all."

The Oriental problem, on which the author has written emphatically, is treated with marked restraint.

The book is amusing, well illustrated, and, in spite of inconsistencies, fulfils its purpose well. It shows that the land between the Rockies and the Pacific is confronted with special problems which are due to its own peculiar character, and that these problems cannot be stated in terms of "great open spaces" and "need of population," so generally applied to Canada. R. P. B.

A JOURNEY TO ALASKA IN THE YEAR 1868: being a diary of the late EMIL TEICHMANN. Edited with an introduction by his son OSKAR. *Privately printed at the Cayme Press, Kensington* 1925. 8×7 *inches; 272 pages; sketch-maps and illustrations*

Major Oskar Teichman has done well to rescue from oblivion the diary kept by his father, the late Emil Teichmann, during an adventurous journey to, and stay in, Alaska, just after the territory had been purchased from Russia by the United States Government. At the age of twenty-one the author of the diary had entered the New York branch of Messrs. J. M. Oppenheim & Co., fur merchants, who had extensive dealings with Alaska, and on the transfer of the territory found it necessary to send a representative there to safeguard the firm's interest. Young Teichmann was chosen for the mission, which proved to be one of great difficulty and even danger. Communications were most

uncertain, and having after some delay reached Victoria, B.C., by way of the Panama Isthmus and San Francisco, Teichmann was forced to join with a few others in chartering a small sailing sloop for the further voyage to Sitka, the chief settlement of the Russians in Alaska. Apart from the thrilling episodes of this voyage the narrative (originally written in German for the benefit of the author's parents) supplies a valuable record of the conditions during a period of transition in that part of the world, when the Americans were just beginning to establish themselves in their new territory, when the British claim to jurisdiction on the Pacific coast had not long been finally vindicated, and when the whole region was overrun by fortune-hunters of low class. To a man of refinement the author's experiences must have been distressing in the extreme, and only a man of courage and resource could have carried through the task.

The vessel which took him and his fellow-passengers through the intricate channels of the "inner" passage to Alaska was but 20 feet long, with no shelter but a tiny cabin 4 feet high, and as constant storms were encountered the discomforts of the twenty-six days' passage may well be imagined. Added to this the crew of two proved to have a most imperfect knowledge of the route, and it was only by the guidance of Indians that the party at last groped their way to their destination. A pleasant interlude was the hospitable reception at the Hudson Bay Company's post at Fort Simpson, and the newly established American Fort Tongas was also touched at, but the rest is a story of almost incessant toil and peril. The author was a shrewd observer and gives interesting notes on the country and the Indians met with, illustrating them by many original sketches. His stay at Sitka, where all the loose characters of the whole region appear to have congregated, was not without its dangers, and he thought himself fortunate in coming through without being robbed of his valuables. Portraits of him are given both as a young man and towards the end of his life.

MAYA CITIES. By Dr. THOMAS GANN. *London: Duckworth* 1927. 6×9 *inches; 256 pages; illustrations.* 21*s*

To pick up another of Dr. Gann's volumes of exploration in the Maya regions of Central America and southerly Yucatan is like finding a new instalment of an interesting serial story. And this is just what 'Maya Cities' has to offer: the latest record of the author's day-to-day adventures in search of signs of the old culture of the native folk who flourished before the Spanish Conquest.

In the present volume Dr. Gann gives an account of his last season's work and wanderings: in the region of Chetumal Bay, up the Rio Nuevo and Rio Hondo, discovery of the ruins of Tzibanché, investigation of the Ambergris Cay environs, visits to the wary Santa Cruz Indians, and an expedition to ruins near Benque Viejo (up the Old River of British Honduras) in co-operation with an official of the British Museum, which body has now formally taken over the investigation of archæological sites in the colony of British Honduras.

The remarkable ruins of Xunantunich and Minanhá (the latter a new discovery) were examined during this journey, and, while both time and money are needed for further work, enough was seen for the importance of these remains to be made certain; the key to the great mystery of the rise and fall of Maya civilization may lie within the territory of British Honduras.

Dr. Gann's subsequent travels to Uaxactun, Tikal, and to the great Lubaantun site to which the British Museum is devoting particular attention, followed; the author is a member of the British Museum Advisory Committee dealing with work in this Central American colony.

Dr. Gann's new chapters of adventure are, as always, written in an easy

descriptive style which makes excellent reading. The illustrations, chiefly from photographs taken on the various journeys, are copious and good.

L. E. E.

PLACE-NAMES OF BANKS PENINSULA. By JOHANNES C. ANDERSEN, F.N.Z.INST. *Wellington: by Authority: W. A. G. Skinner* 1927. 8×5 *inches; 238 pages; map.* 14*s*

This book is one of several examples of the Dominions' awakening interest in the origin of their place-names. It is written by a member of the recently (1924) appointed Geographic Board of New Zealand, which is stated to have similar functions and powers to the Geographic Boards of Great Britain [*sic*] and Canada. He deals exhaustively with a very small area—not larger than the base of Etna—and calls his work a topographical history, arranging his material in the form of an alphabetical list of names prefaced with a general introduction. In the latter we are told that there were two waves of Maori occupation in Canterbury, which account for dialectical differences of spelling, especially the interchange of *k* and *ng*, as in Waitaki, Waitangi. It is satisfactory to learn that Maori names persist, in spite both of the local disappearance of Maoris and also of attempts to substitute British names, which have supplanted the older in very few instances. However, a good many places in the list seem to have both, though it is not always clear whether a name is in present-day use or has merely been taken from old records; and the map does not help us owing to being so much reduced from the original as to be often illegible. It would have been useful if the meaning of Maori names had been generally and the pronunciation occasionally given.

Non-native names began in 1770 with Cook, who gave the name of his F.R.S. passenger to what he thought was an island. Some French names, like Duvauchelle, recall the fact that the French negotiated the purchase of the peninsula from the natives in 1838 and sent out emigrants, whose arrival and possible hoisting of the tricolour were forestalled by the proclamation of the Queen's sovereignty in 1840. Whalers were responsible for many coastal names, among which the most remarkable are (1) Snuffle Nose, said to be a corruption of the Icelandic Snafellnaes [*sic*; ? Snæfellsnes] and to have dated from the visit of a Danish ship; and (2) Goashore, turned by the natives into Ohahoa, later mistaken by the settlers for a native name and mispronounced, amongst other forms, O-ihoa, which, bearing the meaning of the Place of Jehovah, had a story invented to account for it! There is a suspiciously similar ring in the two names of the headland said to have been called Heroine after a French corvette but known to the Maoris as Te Ruahine (misspelt on the official maps Truini).

The author mentions in passing that Christchurch, which is just outside his area, was named after Christ Church, Oxford. We are glad to have this definite statement from an authoritative source, as New Zealand historical and geographical books successfully avoid giving the origin of the name. As Christchurch is on the river Avon, it would have been pardonable to assume that the pair of names originated in Hampshire; but a note in Playne's 'New Zealand' points to the probability that the river was called by Scottish settlers after the stream in Lanarkshire. There was also the possible solution that the Canterbury Pilgrims, as the Anglican settlers were called, named their town after the archiepiscopal cathedral church at home; and this is the derivation given in Canon Isaac Taylor's 'Names and Their Histories.' But we wish the author had stated the reason for the name, and we hope we are right in guessing that it was bestowed by the chief founder of the town, J. R. Godley, who had been educated at "The House."

J. H. R.

THE POLAR REGIONS: A physical and economic geography of the Arctic and Antarctic. By R. N. RUDMOSE BROWN. Methuen's Geographical Series. *London: Methuen* 1927. 9×6 *inches;* x+246 *pages, and sketch-maps.* 12*s* 6*d*

Dr. Rudmose Brown has done a great service in placing before the public a considered account of the geography of the Polar Regions. Something of the sort has been attempted before, but never in the textbook method, we believe, and never with such balance and thoroughness.

It is a constant complaint of teachers that they cannot teach without text-books. Admitting for the sake of argument that teaching should depend on text-books to such an extent, there is now no reason why those spacious regions of the world should any longer be omitted from the schedule of school geography; nor does Dr. Brown leave any loophole for those whom he calls "the newest school of geography" to excuse themselves from dealing with the Polar regions on account of the absence of man there. For the book may be described as an account of the manifold reactions, physical, political and economic, between the temperate and the polar regions.

It has been a habit, and to some extent a policy, of the Press to endeavour to surround the polar regions with an atmosphere of romance and mysticism, the natural result of the adventurous explorations of earlier times. This atmosphere is being disturbed regularly by the fact that almost every year there is an expedition or two to the North Polar regions, led and carried out by undergraduates of European and American Universities. But this text-book will do much more to dispel that atmosphere, or at least reduce it to a reasonable density, by the calm and matter-of-fact manner in which the whole subject is viewed. The sequence of treatment seems admirable, the author leading up from the physical basis to the human activities, such as they are of the regions.

Some of the chapters give information which is not only up-to-date but is viewed with a perspective which could only be attained by one who, like the author, has had personal—one might almost say habitual—contact with the regions concerned. One might single out for special reference the sections dealing with the whaling, with political geography, and with Polar hygiene. The sketches of the history of exploration are naturally reduced to small proportions, but we would suggest that in future editions more might be said about the evolution of methods of travelling, which is to a large extent the key to all Polar exploration. For the benefit also of those whose chief interest lies in the human element, one could wish for more extended treatment of the Eskimo.

We must interrupt the general tenor of congratulation on the book by remarking adversely upon the maps. Those in the text are simple to a degree that is practically a fault, and the folding ones at the end are on too small a scale to be of much value; that of the North Polar regions in particular wastes its own space by continuing down to the Tropic of Cancer.

The Bibliographical Appendix at the end is excellent. F. D.

THE CLIMATES OF THE CONTINENTS. By W. G. KENDREW. Second edition. *Oxford: Clarendon Press* 1927. 9×6 *inches;* xvi+400 *pages, and* 153 *illustrations.* 21*s*

The first edition of 'The Climates of the Continents,' which appeared in 1922, was fully reviewed in the *Geographical Journal* for February 1923, and the present reviewer concurs generally with the remarks made on that occasion. The reviewer then welcomed it as filling a gap in English scientific literature; both the former existence of this gap and the adequate way in which the author

has filled it, are shown by the fact that a second edition was called for within five years of its first publication. Excellent reasons for this are to be found in the admirable lucidity of treatment and the abundance of illustrations, while the book contains a great deal of statistical information which, while not always the most recent available, is invariably well chosen.

Carrying out the promise of his title, the author deals successively with Africa, Asia, Europe, North America, South America, Australia, and New Zealand. In the new edition he has rounded off the scheme by the addition of a useful chapter on Antarctica, which he regards as possessing a typically anticyclonic climate, marked by clear skies and vigorous radiation, dry air, scanty precipitation, and frequent calms and light winds. Full attention is given to the climatic aspect of blizzards, and the remarkable temperature phenomena are also discussed.

One can only add that the book should form part of the library of all who are interested in the wider physical aspects of geography. C. E. P. B.

RULERS OF THE INDIAN OCEAN. By Admiral G. A. BALLARD, C.B. *London: Duckworth* 1927. 10×6 *inches;* xvi+320 *pages; illustrations and sketch-map.* 21*s*

This work ought to arrest the attention of students by the novelty of the greater part of it. Eight of the fourteen chapters are wholly or mainly devoted to the maritime achievements of the Portuguese, and it is the first time that these have been related and criticized by a sailor with both technical knowledge and long service afloat. The dominion of the Indian Ocean, probably planned and certainly established by Albuquerque, has, as the Admiral points out, no exact parallel, because it subjected that large area to the condition of territorial waters. Other nations have driven their enemies off the sea and blockaded them in port, but none have been able to regulate sea traffic during a long period. For about a century no vessel could navigate that ocean without a Portuguese permit. This dominion was secured by controlling the three bottle-necks of traffic, the Straits of Bab-el-Mandeb, Ormuz, and Malacca. The very inadequate resources at the disposal of Albuquerque made his success the more wonderful; in 1510 when he finally possessed himself of Goa, destined to be the pivot of this new kind of rule, there were only 2000 Portuguese in India, and his constant cry in letters to King Manoel was for more men. The population of Portugal herself in this time of her greatness did not reach two millions, yet she was able to control an area from the Persian Gulf to the Cape of Good Hope and from the East Coast of Africa to the Moluccas. No better proof could be furnished of the value of sea power when provided with suitable bases; the Portuguese could concentrate on a danger spot and strike, or retreat, as they wished. The superiority at sea of the white man over the brown was a cause of the result achieved, but this could not have been obtained without the direction of a genius, and Admiral Ballard considers that the name of Albuquerque still holds the first place in the history of the Indian Ocean. The policy of racial adulteration was, he thinks, his one great mistake. It was a time of big men. In describing the work of Bartholomew Dias in overcoming bad weather and strong adverse currents, the author says: "None can fully appreciate what lay before the first man to double the Cape, except the now fast-dwindling band of professional master mariners who have followed him without steam-powered vessels"; the run of da Gama in 1497 from the Cape Verde Islands to the southern point of Africa "has a strong claim to rank as the finest feat of pure navigation ever accomplished." It needed courage to strike into the unknown and sail for ninety days out of sight of land which his

predecessors had hugged, and he marked down a route which was used for four centuries. The battle of Diu in 1509, won by D. Francisco d'Almeida, asserted that control of the sea which Albuquerque stabilized, raising land fortresses at Ormuz, Malacca, and Diu as *points d'appui*. Admiral Ballard is right in contending that the failure to capture Aden mattered little; it was enough that a hostile fleet had entered the Red Sea, a "buffet in the house of Mahomet," as Albuquerque called it, and that the Sultan of Egypt took such alarm as to act henceforth on the defensive. He did not however lay up his fleet of galleys; their construction had been suspended after the defeat of Mir Hocem.

Forgotten facts are recalled in this book and others shown from a new angle. Even in their "decadence" the Portuguese held Malacca for eleven years against the Dutch blockade, and the Persians could never have reduced Ormuz without English aid. We are told that one of the reasons why the Dutch fixed their capital at Batavia was that it lay to the windward of Goa and gave them the initiative in attacking the Portuguese; this would not have occurred to a landsman. Admiral Ballard would probably endorse the opinion of Hunter about Portuguese rule in the Indian Ocean: "it would have been a splendid achievement for a great power; accomplished by a small kingdom it makes the history of Portugal read like a romance."

Later chapters deal with the more familiar subjects of Anglo-French rivalry, and at the end the Singapore base is discussed.

There are of course errors. The doubling of the Cape cost far more than thirty years of effort; the reasons for the delay in following up the discovery were not as stated, but the illness of John II and his wife, the death of their only son, and internal trouble. The Dutch were able to capture Ceylon and the Malabar fortresses largely because Portugal was engaged in the twenty-eight years' war with Spain and in the attempt to recover Brazil and Angola, so that she could send no help. In the end, however, the result would have been the same, because the Dutch had six ships to every one of their rivals.

The great defect of the book is the absence of all reference to authorities, which renders it difficult to check many statements. This should be remedied in a second edition, and an authentic portrait of King Manoel substituted for the fancy one. E. P.

HISTORICAL ATLAS. Prepared by Prof. WILLIAM R. SHEPHERD. Sixth edition. *London: University of London Press Ltd.* 1927. 10×7 *inches;* xi+216+94 *pages.* 18*s*

Judged by the standard of similar publications, this historical atlas, edited by an American, published in London, and printed in Germany, is a useful and thorough compilation. Its numerous plates, over two hundred, range over all history and all continents except the Polar, and as a whole show clearly the superficial extent of political and ecclesiastical powers. Their comprehensiveness and detail deserve to be emphasized in this short note. In some the scheme of colouring might be more clearly explained. On the map entitled "Treaty adjustments, 1814, 1815," for instance, it is not obvious exactly what territorial transactions are shown. Though it probably would not claim to illustrate geographical discovery with completeness, this aspect might have received more attention: the voyages of Torres and Tasman, for example, are not shown even in the Australian map.

The relations of the various sovereignties to the geographical features bound up with their rise and fall, which is the root of historical geography, are not so satisfactorily shown. This is a common failing of such atlases, but it may perhaps be mentioned here since there are signs that this shortcoming is at

least realized by the compiler. The dust-cover bears the assertion that world history cannot be followed " unless we understand the setting of the stage on which it is acted." As the physical maps provided are not numerous or conspicuously good, and other factors, with few exceptions, are neglected, there is not the material to form an adequate conception of the different environments. The understanding of the influence of geography on South American or Australian history is scarcely illustrated by a map of the various political units to which a few explorers' routes have been added.

There is a very full index of place-names, ancient and modern, and a useful list of authorities consulted, in which however the valuable ' Geschiedkundige Atlas van Nederland ' does not appear. G. R. C.

THE PRINCIPAL NAVIGATIONS VOYAGES TRAFFIQUES AND Discoveries of the English Nation made by sea or overland to the remote and furthest distant quarters of the earth at any time within the compass of these 1600 years. By RICHARD HAKLUYT. With an introduction by JOHN MASEFIELD : fully illustrated with sixty-four drawings by T. Derrick, and many reproductions from contemporary portraits, etc. 8 volumes. *London : J. M. Dent & Sons Ltd.* 1927. 8×5 *inches.* £3

It is remarkable that those interested in such matters should have had to wait till the twentieth century for a handy version of the national epic of early British enterprise overseas. When in 1905 Messrs. Maclehose of Glasgow had completed their standard edition of Hakluyt in twelve 8vo volumes, an arrangement seems to have been arrived at whereby a popular edition of the more important parts, with a short introduction by Mr. John Masefield, was issued by Messrs. Dent (as eight volumes of their ' Everyman's Library ') on the basis of the text of the Glasgow edition. But while this last was beyond the means of many, the small size and lack of illustrations in the more popular issue were hardly in keeping with the importance of the subject-matter. Scope was therefore left for an edition intermediate between the two others both in size and price. This has now been supplied by Messrs. Dent through the reprint of the Everyman edition on larger paper and with the addition of many illustrations, which not only enhance the appearance of the work, but help to re-capture the atmosphere of the days in which the voyages were made. It ought certainly to meet with favour from a public more keenly alive than ever to the fascination of such early narratives.

The publication of the work by Messrs. Dent in both forms was no doubt greatly helped by the permission given by Messrs. Maclehose to take the text of their edition as the basis, and in the prospectus to the present issue much stress was laid on the advantages thus secured. When however it was claimed that their issue thus shared in the " scholarly editing " of the Glasgow edition, this might easily be taken to imply more than the facts warrant. For the edition thus followed was professedly an exact reprint of that of 1598–1600, and the editing (apart from careful proof reading) consisted merely in a few typographical modifications. There was no attempt at explanatory notes, which would indeed have swelled the bulk quite unduly. It is the text of Hakluyt that is really wanted, and the eight volumes now issued include all the most important parts of the original, while the promise of two supplementary volumes dealing with foreign voyages originally omitted will bring the work still nearer completeness for those who care to take them.

As already stated, the illustrations are a really new feature, and as there are fourteen in each volume, they are a substantial help towards an understanding of the times dealt with. They are of very varied subjects, generally well chosen,

including portraits, old maps and views, etc., either in facsimile or re-drawn by Mr. Thomas Derrick, who contributes in all sixty-four of the drawings. Some are more or less imaginary reconstructions of special episodes, but even so are often based on actual old documents. The re-drawing of portraits is not always quite successful, *e.g.* that of Mercator seriously alters both the form and expression of the features, and a photographic reproduction of the well-known portrait would have been more to the purpose. (It is strange that the false concord " Gerardus Mercatoris " in the statement of source should have been allowed to stand, both beneath the portrait and in the list of illustrations.) A praiseworthy feature is the care with which the provenance of the illustrations is explained throughout.

RAFFLES; 1781–1826. By R. COUPLAND. *Oxford: University Press* 1926. 9×6 *inches;* 134 *pages and a map.* 6*s*

This is a short but excellent study of the great, many-sided, and much-harassed man to whom his country owes Singapore and the London child the Zoo. It makes no claim to be a full-dress biography, but it is accurate, informative, and eminently readable. As an introduction to the study of its eponym—whose wonderful work is, perhaps, not fully appreciated even now—one could ask for nothing better.

Sir Stamford Raffles' short life—he was only forty-five when he died—presents a picture of an incessant struggle waged, on his country's behalf, by a man who refused to admit defeat; and directed impartially against both the Dutch East Indian authorities and his own official superiors at home and abroad—the struggle being punctuated, at regular intervals, by a series of bitter disappointments, any one of which would have crushed a more resolute spirit. How Raffles, always at his best with his back to the wall, snatched triumph out of disaster, and, single-handed, made good our hold upon Singapore in the teeth of all opposition, is a fine story; and it loses nothing in the telling at Mr. Coupland's hands.

Not the least valuable portion of the work is the list of authorities, which also serves, to some extent, as a bibliography. There is a small but very useful outline map of the Malay Archipelago at the end of the book. Unfortunately, there is no index.

FISHING FROM THE EARLIEST TIMES. By WILLIAM RADCLIFFE. Second edition. *London: John Murray* 1926. 9×6 *inches;* xviii+494 *pages, and illustrations.* 21*s*

Nothing but praise can be given to this scholarly book (now in its second edition), which deals most exhaustively with Greek, Roman, Egyptian, Assyrian, Jewish and Chinese piscatorial art from the earliest times.

Among other subjects, it traces out the first mention of the rod, of fixed and running lines, the reel, and the artificial fly, bait, and tackle. We are told that Aristotle foreshadowed scale reading and that fish hear sound. There are many notes on the propagation of eels and the ancient idea as to how and whence eels are bred: we read of the use of the barbless hook and float, and of the introduction of carp, pike, and grayling into this country. There is an interesting chapter on Roman fishing regulations, and the Egyptian section has a chapter on tackle, the horsehair and flax lines (gut being then apparently unknown), hooks, bait and tickling for fish. In Pliny the younger and Martial one finds what among our classical writers seems the nearest approach to a picture of our English sportsman, delighting in his own place, however small, in the country, and in country pursuits, and the author states that if we cannot

claim for Martial the first mention of the jointed rod and the natural or artificial fly we are safe in acclaiming him the author of the first notice "Fishing Strictly Prohibited."

The book treats of many other subjects dear to an ardent fisherman, and is provided with a number of illustrations. It is evident, as the author says, that its writing has been a labour of love. No one could have carried out such an exhaustive research unless he had been a true lover of the gentle art of fishing.

J. C. E.

SEA WAYS AND SEA TRADE. By A. C. HARDY. *London: George Routledge & Sons Ltd.* 1927. 10×6 *inches;* xv+240 *pages, and illustrations.* 15*s*

We are grateful for another sea work from the pen of Mr. A. C. Hardy, who here gives us much valuable and interesting information in a novel way. Such technical information as that on trade route and trade flow is fixed in our minds by charts.

Nowadays special classes of ships for special trades such as meat, oil, fruit are required. For fifty years locomotives of British make have been sent all over the world, and until recently they were always dismantled and stowed away in boxes. But to-day ships are designed to transport the biggest locomotives and carriages complete. The latest ship of this class is the *Belpareil*, and she is designed to carry rather more than 10,000 tons deadweight. In addition to this, there are special ships for passenger services in different climates—temperate, tropical and frigid, besides other types of ships for lake, river and canal navigation.

The last-named types are to be seen on the great lakes of North America. The world's largest bulk freight carrier, the *Canaller*, which is the most flexible of the lake-ship types, is specially built to navigate the smallest Welland canal lock. Nearly all Montreal grain is handled in ships of this type. As there are "Canallers" so there are "Lakers." These latter, by virtue of their size—some are 600 feet long—cannot pass the Welland Canal locks.

Writing of present-day ships and their functions in chapter 8, the author briefly describes how great is the change in sea life and duties. To-day such devices as the gyro-pilot steering the ship on a straight course have nearly eliminated the need of a quartermaster at the wheel.

The ever-increasing trade in fruit-carrying, especially bananas, as a cargo is duly noted in chapter 9. It is a huge trade, as shown by a consumption of over 6,000,000,000 bananas in the United States in the course of one year, irrespective of the large trade with European markets. Our own trade in bananas is from Jamaica and the Canary Isles. The fruit from the Canary Isles does not require refrigeration: it is sent on open deck.

Passenger services, or human cargoes as the author calls them, are on the increase. Good business is done in world tours; the voyage of the motor ship *Asturias* in 1927 round Africa is an example—by no means new, however—of this class of trade.

The author also deals with river services, their inter-relation and their relation to the wider sea-trade—information not easily obtainable elsewhere. Ocean liners go up the Amazon to Manaos in Brazil, 980 miles above the mouth, while average-sized cargo vessels can penetrate to Iquitos in Peru, 2,166 miles above the mouth. Some salient facts concerning the world's principal waterways are given in a table on p. 175. The Nile is essentially a tourist's river, probably the largest tourist's river in the world.

Such important matters as ships' fuel requirements, bunkering ports of call,

sea lights on headlands, lightships and pilots are adequately dealt with. Cordially do we agree with the closing remark that every nation must learn to think internationally, as a sure means of attaining international amity.

V. S. F. W.

THE STONE AGE. By E. O. JAMES. *London: The Sheldon Press* 1927. 7×5 *inches;* xv+202 *pages; illustrations.* 3*s* 6*d*

Several attempts to popularize the early history of man have been made recently. Mr. James offers an outline which will hold the attention of the general reader without the assistance of attractive generalizations or neglect of the more intricate problems of his subject. The somewhat forbidding glossary of terms and the table of cultural divisions with which the book opens should not deter the prospective reader. The author deals with the various theories cautiously and impartially. A useful feature is the careful description of the various human remains, the environment of the finds, and the circumstances of their discovery. The general impression derived from the opening chapters is the paucity of the early record, in itself a tribute to the author's restraint in avoiding fanciful reconstruction. The necessary geological explanations are not as clearly set forth as is the archæology. In one passage he implies, incidentally, that there were agriculturalists in Greenland between 5000 and 900 B.C., confusion surely with the much later Norse settlers. The illustrations of sites, remains, implements, and rock drawings are very clear, and contribute materially to the exposition. Short bibliographies for further study accompany each chapter.

A TEXT-BOOK OF GEOLOGY. By PHILIP LAKE and R. H. RASTALL. Fourth Edition. *London: Edward Arnold & Co.* 1927. 8×5 *inches;* xiv+520 *pages;* 33 *plates and* 134 *figures.* 21*s*

The main criticism which must be urged against the fourth edition of this deservedly popular text-book is that the alterations and additions are incommensurate with the volume and importance of recent work. There is, too, a marked contrast between the two halves of the book. The first half, on general geology, is by Dr. Rastall. By giving numerous references to literature in the footnotes, the onus of following up recent developments is to some extent placed upon the student. Even so, one would like to see further consideration given in the text to such subjects as radioactivity, continental drift, and the wider aspects of petrogenesis. In the second part, dealing with the stratigraphy of the British Isles, the student is placed in a very different position. There is not a single reference to original literature, and the student receives no help in checking the numerous dogmatic statements. By rigid adherence to one particular view, the great problems of the present day are passed over. Thus the Llanvirnian finds no place in the classification of the Ordovician. No mention is made of the Siluro-Devonian boundary dispute, or of the diverse views concerning the relationship between the Permian and Trias. It may be that the authors feel the very real difficulty of offering a summary of recent work, or it may be that they consider that the results of research should find no place in a text-book until the passage of time shall have proved their acceptability or otherwise. It seems a little unfair to the student that the work of Buckman, Lang, Trueman, Spath, Kitchin and Pringle on the detailed zoning of the Jurassic finds no mention; that the modern methods of study of sediments used to such good purpose by Boswell, Milner, Fleet, Heard, Gilligan, and others is also passed over; that the efforts of Leriche, Dollfus, the reviewer, and Wooldridge to read an historical sequence in the Tertiary beds of South-

Eastern England should also be ignored. May one venture to hope that the fifth edition will prove conclusively that the work of the last twenty-five years has not been in vain ? L. D. S.

FROM CARRACK TO CLIPPER: A BOOK OF SAILING-SHIP MODELS. By FRANK C. BOWEN. *London: Halton & Truscott Smith Ltd.* 1927. 10×8 *inches;* vii+64 *pages; diagrams and* 67 *plates.* 12*s* 6*d*

The increasing vogue of sailing-ship models is attested by the appearance of this popular and moderately priced sketch for collectors. The excellent plates particularly will be of assistance in determining the period, provenance or genuineness of models. At the same time the general reader, though occasionally liable to be baffled by some term or more minute technicality, will find here some profitable reflections upon the course of history, more especially of British naval history. It may surprise him to learn that, despite the usual silence of historians on the point, the interest of the Stuarts in their navy was real and valuable. Accustomed, largely no doubt from tales of adventure, to the general neglect and thankless life endured by the crews, he will probably also be surprised to learn that the ships themselves were often not only badly equipped but also inferior in design to their opponents. Fortunately, the characteristic conservatism of the authorities did not prevent them from copying successful features from captured vessels. The index is rather meagre, and a glossary of terms would be of considerable assistance in a popular work.

COLLEGE GEOGRAPHY. By Prof. RODERICK PEATTIE. *Boston: Ginn and Company* 1926. 8×6 *inches;* xii+496 *pages; illustrations, diagrams and maps.* 12*s* 6*d*

English readers may be pardoned if they are misled by the title of this book. 'College Geography' is, perhaps, reminiscent of the rather dull and old-fashioned text-books on the subject. In his preface the author writes: "This book is designed for a serious course in geography of college grade. . . . First and last, it is limited to principles . . . (and) . . . may serve as an introduction to either a study of economic geography or to a course in regional geography." We are in general agreement with this, and think Prof. Peattie has produced a volume well worth attention.

In point of fact the book is an interesting and instructive work dealing with Human Geography—bringing out particularly the influence of environment. Due acknowledgment is made to the well-known work of Miss Semple. Prof. Peattie has given a very lucid outline of the main problems and scope of Human Geography. The book is pleasantly written and well illustrated. It should prove of considerable interest to English students who often want a general work of this kind. The bibliographies are also good and full, and we note with pleasure that the books and authorities cited are quite representative. There is also an index.

The plan of the book is simple and straightforward. The early chapters deal with the scope of the subject, and with the general aspects of climate and weather. The remaining chapters are mainly devoted to conditions of life in various typical regions—the Jungle, the Desert, the Sea and Sea-Margins, Rivers, Plains, Mountains, etc. Each chapter is followed by suggestions for further study of the subject-matter dealt with in it.

There are one or two minor slips in the text, *e.g.* Cambridge (England) is described as a Cathedral City.

The book may be recommended to all who are interested in geography, and should certainly prove of value to students who are about to undertake a course in anthropogeography. J. A. S.

THE DOMINIONS AND COLONIAL OFFICES. By Sir GEORGE V. FIDDES. *London: G. P. Putnam's Sons Ltd.* 1926. 8×5 *inches;* 288 *pages.* 7*s* 6*d*

THE INDIA OFFICE. By Sir MALCOLM C. C. SETON. *London: G. P. Putnam's Sons Ltd.* 1926. 8×5 *inches;* vii+299 *pages.* 7*s* 6*d*

These volumes form part of the "Whitehall Series," which, under the general editorship of Sir James Marchant, is designed to afford accurate and detailed information upon the organization and working of the principal Government Offices.

Sir George Fiddes, who was Permanent Under-Secretary of State for the Colonies from 1916 to 1921, and who has undertaken the volume dealing with the Dominions and Colonial Offices, has produced a very adequate account of their origin and development, containing a vast amount of valuable information. It is however written—perhaps necessarily—in a style faintly reminiscent of the average Blue-book, and the general reader may be pardoned for finding that portions of it are scarcely exhilarating.

Sir Malcolm Seton, Deputy Under-Secretary of State in the India Office since 1924, writes of his Department no less competently, but with a lighter touch. He can even poke gentle fun at it—witness his description of its building, in which "Governors-General were used instead of gargoyles for external decoration" (p. 266) and two statues of Clive and Admiral Sir George Pocock made to "supplement Roman costume by the insignia of the Order of the Bath" (p. 271). His sense of humour, in fact, is for ever making welcome appearances in the most unexpected places. It is delightful, for example, to be reminded (p. 156) that "the idol in a Hindu temple may hold property and engage in litigation through its lawful guardians"; a similar vein runs through many narratives, such as those of the genesis of the Star of India (pp. 180–184) and of the late Sir George Birdwood's monograph on the Carrot (pp. 277, 278); and "the casual reader may wonder" (and laugh) at many things in the book besides the vexed question of why "... a Director of Zoological Survey should rank three classes below an Archdeacon of Bombay, but three classes above an Archdeacon of Lahore" (p. 184).

While, however, such touches make Sir Malcolm Seton's work eminently readable, he never employs them as a means of evading his responsibilities. The book is full, well balanced and informative, and should be of great value to all who take an interest in Indian affairs.

It is pleasant to note that room is found (pp. 253, 254) for a short account of the late Geographical Department of the India Office, and of the ten years' work performed there by Sir Clements Markham, which culminated in the latter's 'Memoir on the Indian Surveys.'

THE MONTHLY RECORD

SHRINKAGE OF CHALK STREAMS IN EAST KENT

In a paper recently read before the Royal Meteorological Society entitled "Early Water-mills in relation to changes in the rainfall of East Kent," and published in the Society's *Quarterly Journal* for October 1927, Mr. G. B. Meyer adduces evidence that the rivers of this part of the country have shrunk considerably in the course of the past thousand years. A sketch-map indicates East Kent as outlined in Doomsday Book with the course of the streams, and with Thanet as an island. There is evidence of the existence of water-mills

in the upper valleys of the Stour, Little Stour, Dour, Gestling, Northbourne and Eastry Brook, which are now quite dry except for the infrequent bursting of "nail-bournes." The details of the history of these mills are derived from such works as Hasted's 'History of Kent,' Rice's 'Ancient Britain,' Bennett and Elton's 'History of Corn Milling,' and others. As regards the Stour at Canterbury a marked reduction of flow about 1275 is apparent which, incidentally, agrees with Brooks' curve of rainfall for Eurasia in 'Climate through the Ages.' On the Little Stour there were mills as far up as Barham, and Bekesbourne was a "non-corporate" member of the Cinque Ports until a decrease in the flow of the river led to the silting up of the channel. Sandwich Haven has silted up and become dry land. In order to appreciate fully the significance of the various inferred changes it is necessary, as the author points out, to be thoroughly familiar with local geology, hydrology, and history. After discussing the various factors affecting the discharge of these Kentish streams, and of possible changes in the faulting and fissuring of the chalk that might be attributable to a number of slight earthquakes recorded in the district in the last thousand years, Mr. Meyer comes to the conclusion that the decline of the rivers in question could only have resulted from a decrease in the rainfall. His case was generally allowed not only by the meteorologists present at the meeting but also by a geologist of standing with an intimate knowledge of the district. It is worth noting that the present rainfall in the seaward end of the North Downs where the rivers in question rise is the highest in the south-east of England (exceeding 40 inches at Paddlesworth at the back of Folkestone), so that the rainfall must have been very heavy indeed at its maximum.

Similar studies in other districts of complex hydro-geology would be valuable. Near London, for instance, a close watch could be kept on the remarkable system of "swallow-holes" at North Mimms near Potters Bar. Here a stream coming down from the clay lands of the North Middlesex ridge disappears at "Water End" through chalk and overlying deposits, draining underground into the Lea, but at times of heavy rain forms a lake overflowing in quite the opposite direction into the Colne. The response in the various phases of the stream to the fluctuations of rainfall is very rapid, and one may readily believe that long-period fluctuations of the kind in question would effect marked changes in the hydrology of the system.

DISTRIBUTION OF FOG IN DENMARK

With a moist cloudy climate marked by rapid fluctuations of temperature and humidity Denmark, like Holland and England, is familiar with dense fogs, though the frequency thereof in this belt of Europe is often much exaggerated. The subject is particularly interesting in the case of Denmark on account of the very complex distribution of land and sea in and around that country. One therefore welcomes a paper on the subject by Karl Heinrich Soltau entitled "Die Geographische Verbreitung und Bedeutung des Nebels in Schleswig-Holstein und Dänemark," treating of the matter from a geographical rather than a meteorological standpoint (*Veröffentlichungen der Schleswig-Holsteinischen Universitätsgesellschaft* Nr. 7). The study goes into the geographical and seasonal distribution of fogs in the Danish area, the favouring meteorological circumstances in relation to the nature of the surface, and certain effects of fog in relation to agriculture, industries such as rope-making, as well as the destruction wrought in woodlands by heavy deposits of rime when fog occurs with frost.

The number of days in the year on which fog of varying density is recorded

in the area (which is much of the same order as in England, according to Meteorological Office statistics) varies from 45 in the interior of Schleswig-Holstein and 40 on the west coast of Jutland and north coast of Zealand, to 25 on the east coast of Jutland and in the Belt seas and islands. In general fog is most frequent along the coasts where horizontal temperature gradients favouring the mixing of air currents of different temperature and humidity are steepest; but the maximum at Neumünster in the interior of Holstein is a consequence of the district being subject to fogs driven in from both the North Sea and Baltic. In the Belt seas there is less fog than along other coasts because they are very narrow and dominated by land influences. The land fogs of Denmark, as with us, are fundamentally winter phenomena, but along the coasts there is a spring maximum because of the frequency with which land-warmed air at that season flows over cold sea-water. In the twenty-one years 1900–1920 fog was widespread over the entire Danish area on three occasions for a continuous period of nine days, and once for seventeen days.

Reference is made to other foggy areas of the globe, to wit the famous Grand Banks of Newfoundland, where the fogs, as in Denmark, are highly irregular in their occurrence in accordance with the variability of the weather, and the west coasts of South America and South Africa, where, with the more stable trade-wind regimen, they are more regular and persistent. Not a single reference, however, is made to the Netherlands or the British Isles, which may be said to belong to the same zone as Denmark. From a geographical point of view the fogs of England may be most instructively classified into (1) sea fogs with a maximum frequency in the early summer; (2) lowland or valley fogs, favoured by nocturnal radiation under clear skies with a conspicuous maximum in mid-winter; and (3) upland or hill fogs common at all seasons, but most accentuated in the wet and stormy winter months. The lowland and upland types require entirely opposite meteorological conditions for their development, and, whilst much depends on local configuration, there is a certain critical level about 500 feet above the sea which gets little fog of either type, but on the other hand occasionally comes within the range of an unusually high lowland fog and sometimes of an unusually low hill fog.

It must be understood that in this paper "fog" or "mist" is used in the meteorological sense of cloudy condensation occurring at ground-level, occurrences of which for statistical purposes have to be somewhat arbitrarily defined by a certain range of visibility.

DANISH WORK IN CENTRAL ICELAND

In the *Journal* for December 1927 we gave a short note on the work of the recent Danish Expedition to Iceland. There has since appeared a fuller note in *Nature*, 21 January 1928, by Dr. Niels Nielsen, the leader of the expedition. The plan was to examine the ice-free country between Hecla and the western part of the great Vatnajökull icefield, linking up with work done by a previous expedition south of Hofsjökull in 1924. The party necessarily employed ponies, for over the greater part of the plateau vegetation is to be found only in scattered "oases." Bases were established at two such oases, Fiskivötn and Illugaver: provisions were taken for nine weeks, which were augmented by hunting and fishing, especially by catches of trout. The scientific equipment included instruments for mapping and astronomical determinations, wireless outfit, and meteorological apparatus. Though the members co-operated at times, the cartographical work was largely done by Steinthor Sigurdsson, limnological and biological observations by Palmi Hannesson, and the study of tectonics and vulcanism by Dr. Nielsen. The results have not yet been worked up, but

some preliminary notes are given. Sufficient material was collected for a general map of the whole district, and detailed maps of areas of special interest. The main topographical features depart essentially from the positions previously assigned to them. A special investigation was made of some peculiar lakes near the ice-margin ; these have a fauna rich in individuals but not in species. Two only were found, one of stickleback and one of trout. Along the ice-margin a plant-world of a remarkable kind was also studied. Among the forms of volcanic action examined were fissure eruptions with lava-fields covering great areas, and single volcanoes with a formation similar to that of Vesuvius. The volcanic activity can be followed down from the end of the Ice Age to the present day. The country west of Vatnajökull has also undergone much seismic disturbance to within a few thousand years. Displacements along S.W.–N.E. lines have divided the country into a number of ridges. The third factor in the formation of the landscape has been the ice, which has many times covered the district. To these must be added modern factors, particularly the erosive power of the high winds which cause violent sandstorms, and of the melting snow. These play a considerable part since surface streams are lacking, much of the water being absorbed and carried great distances underground.

THE PERMANENTLY FROZEN SOIL OF SIBERIA

This phenomenon has lately been discussed at considerable length by W. B. Schostakowitsch, of Irkutsk (*Zeits. Ges. Erdk. Berlin*, 1927, Nr. 7/8). Over the greater part of Siberia there is a layer of permanently frozen soil whose upper surface has an average depth of about 7 metres below the surface, and whose lower surface lies about 20 metres below the surface, with, however, great variations from place to place. For this layer the writer suggests the name *Gefrornis* as less ambiguous than *Frostboden*. Over Northern Asia as a whole the distribution of the frozen layer is discontinuous, but within this area there are three " islands " where it is unbroken. The first and largest embraces the whole of northern Siberia between the Yenisei on the west and the Kolyma on the east, extending south far beyond the *tundra* zone, which is well known to be permanently frozen below the surface. The second is in the south of Siberia, and practically coincides with the Trans-Baikal province, being separated by Lake Baikal from the third and smallest island near Irkutsk. A fourth island outside Siberia is mentioned in the elevated Altai region. The meteorological factors which govern the occurrence and distribution of the layer are the intensity of the cold and the lightness of the snowfall. It is shown that the quotient of the mean air temperature of the three coldest months, December, January and February, by the average depth of snow in January affords a very good index of the distribution of the phenomenon, which fails to appear in those regions where the value is less than $-0{\cdot}5$ and is strongly developed in those where it is less than -2.

In the regions of deep January snow-cover, between 1 and 3 feet, namely, the extreme west and east of Siberia, the layer is entirely absent, but strongly developed in those where it is only 2 or 3 inches. This is in accord with the well-known principle that a blanket of snow keeps the ground warm whilst intensifying the frost in the air above. The presence of the frozen layer greatly affects the hydrology of Siberia both subterranean and surface, and modifies the character of river erosion in ways which are described in detail in the paper. It is also associated with various types of accumulation of ice and snow, one of which is known as " Naledj " (in river valleys) and another as fossil ice. The latter, a relic of the Quaternary glaciers which covered a large area in Siberia, is a phenomenon known in other cold countries such as Finland. It is pointed

out that the permanently frozen layer could not have existed under the copious snowfalls of the Siberian Ice Age. This helps towards an answer to the puzzling question why a country so intensely cold as Northern Siberia containing the chief " pole of cold " in the Northern Hemisphere is so slightly glaciated at the present day, namely, that it is due to the scantiness of snowfall, which permits the mean temperature for a few weeks at midsummer to exceed 60° F. along the Arctic circle.

COTTON IN SOUTH AFRICA

The British Cotton Growing Association has recently issued two pamphlets on the Union of South Africa, Rhodesia and Nyasaland as sources for an increased cotton supply, based on a visit by Sir William Himbury. In all three areas, though cotton growing has been attended with some success, the prospect of large increase in the immediate future is not good. The South African crop increased tenfold between 1918 and 1925, but the yield per acre is considered too low to be encouraging. Failure in some cases has been due to labour shortage ; in more to faulty methods ; but the main cause is drought. While many irrigation schemes are being developed, it is doubtful whether cotton, unlike sugar or citrus, could stand the expense. There is at present no native cotton growing, and it is not likely to be established in the Union. In Southern Rhodesia, the agricultural situation was dominated by the tobacco boom. The farmers, having experienced two bad cotton years recently, had preferred to concentrate on tobacco, though expressing themselves willing to try cotton again under more favourable conditions. There are two experimental farms, on both of which cotton is receiving attention, and ample ginning facilities exist. The position in Northern Rhodesia was very similar: 15,000 acres were under cotton in 1925, but the total failure of that season caused a decline to 800 acres in 1927. Here pests, not drought, were responsible. The farmers recognized the value of cotton, especially as a rotation crop with mealies, and will return to it when conditions are more encouraging. With the further development of mining and, in consequence, agriculture, and the improvement of communications there should be a future for cotton. The native population has so far shown no inclination to produce any commodities for export. In Nyasaland, on the contrary, a striking feature has been the rise in the native share in the total production from 11 per cent. in 1922 to 63 per cent. in 1925. The total production of seed cotton has increased from 300 tons in 1919 to 2000 tons in 1926. The chief necessities at present are the production of better varieties, the elimination of pests, and especially the improvement of communications.

RAINFALL AND FARMING IN THE TRANSVAAL

As success in farming is essentially controlled in South Africa by sufficiency of moisture, the Transvaal University College, Pretoria, has done well to issue a detailed study on the subject (T.U.C. Bulletin No. 12, 1927). The paper, entitled " Rainfall and Farming in the Transvaal," consists of two parts, the first being an investigation into the variability of the rainfall of the country by F. E. Plummer, and the second a discussion of the rainfall in relation to agriculture by H. O. Leppan, with special reference to Mr. Plummer's results respecting the reliability of the rainfall. The rainfall of the Transvaal is essentially a summer one, and the average annual quantity varies from 45 inches in the highest parts of the Drakensberg to about 20 inches near the western boundary. The country is divided for the purposes of the discussion into various regions, each of which is dealt with in some detail with the aid of maps.

The general outcome is a verdict that the Transvaal agrees with other parts of the Union in having a rainfall of low efficiency for agriculture. Its small economic effectiveness is due to its unreliability, high intensity, marked seasonal distribution, and poor distribution within the growing season, together with high evaporation and high transpiration. The country is also unfortunate in respect of the solid forms of precipitation, for whilst snow, which might be a valuable asset in agriculture, seldom falls and then only in the regions of high altitude, hail is such a scourge that in many localities the growing of fruit, tobacco and wheat are hazardous undertakings.

In classifying land for agricultural purposes according to the amount of rainfall, Mr. Leppan states that it is customary to consider areas receiving less than 10 inches to be arid, between 10 and 20 inches semi-arid, between 20 and 30 inches sub-humid, and above 30 inches humid. On this basis he contrasts the general uncertainty of farming in the Springbok Flats area of the Transvaal with a rainfall slightly over 24 inches a year with the splendid results in Essex, with no more than 20 inches. The argument, however, is a little over-stretched in that the average rainfall of Essex is about 23 inches, a value very close to that of Springbok Flats, and it is only in a very small area in the Thames Estuary that it falls slightly below 20 inches.

This study, like others of similar scope, makes it clear that whilst the subject of rainfall in relation to crops is in its broad outlines of high geographical interest, in detail it is a severely technical one. The number of variables concerned in biological reactions is so great that it becomes an impossibility to draw any generalizations that would hold for more than a very small geographical area. Such invaluable work, for instance, as is being done at Rothamsted, tends to show that the optimum conditions of rainfall for various kinds of grain will vary rapidly within a few miles merely in consequence of changes in exposure, soil and geological outcrop. It is hardly therefore to be wondered at if generalized statements in geographical text-books about the climatic requirements for different crops are not always easy to reconcile with one another.

AFRICA: A NEW INTERNATIONAL JOURNAL

The first number of *Africa*, the Journal of the International Institute of African Languages and Cultures, opens with an account of the organization of the Institute, and a statement of its aims by Lord Lugard, the Chairman of the Executive Council. These are twofold: to act as a co-ordinating agency between existing societies and individuals already at work in this field; and to encourage to the utmost fruitful contact between scientists and men of affairs, administrators, missionaries and others. It is unnecessary to stress either the importance of this aim—the need for such co-operation has been constantly urged in recent years—or the numerous subjects which can profitably be studied; for example, the basis of land tenure, of native customary law, or the changes wrought in the native's mode of life through contact as a consumer with European civilization. The Institute proposes to publish, in addition to *Africa*, two series: the one, 'African Studies,' works too long for publication in the Journal; the other 'African Documents,' texts written or dictated by Africans in their own tongue with translations in a European language. A fundamental problem in the preservation and development of African cultures is the provision of suitable text-books and a vernacular literature. A preliminary memorandum by the Council sets out the difficulties involved and the steps to be taken, the ultimate aim being to fit Africans to create, if they so desire, a literature of their own. A pamphlet, 'Practical Orthography of African

languages,' has already been issued and is reviewed elsewhere in this *Journal*. The remaining contents of this number indicate the wide range of the Institute's interests, and should appeal to others than actual students of African anthropology and languages. E. M. von Hornbostel deals in a lengthy paper with African negro music, bringing out its essential difference from European forms: it is "the life of a living spirit working within those who dance and sing," partakes therefore of a superhuman character and is an intimate part of religious expression. The writer fears that attempts to protect it are now too late, through the spread of European fashions. A similar little-known subject, the existence of a native theatre, is described by MM. Henri Labouret and Moussa Travélé ("Le théatre mandingue, Soudan français"). This flourishes in the region of Bougouni and Bamako, the centre of a former extensive civilization: the pieces are comic and satirical, never tragic or moral, and are usually concerned with marital misfortunes. Shorter articles include "Sprache und Volkstum," by C. Meinhof, "Primitive law in Eastern Africa," by J. H. Driberg, and "Anthropology and Christian missions," by R. S. Rattray, which urges, in the words of the Rev. E. W. Smith, the "Christianization of everything that is valuable in the African's past experience and registered in his customs." The unique nature and importance of this experiment in the development of a native culture under the guidance of an alien civilization should secure support for the Institute. The annual subscription is £1, which includes the quarterly issues of the Journal, published by the Oxford University Press.

CROSSING OF NEW GUINEA

In the *Journal* for May 1927 a short account was given of the plans and early stages of an expedition in North-West Papua under Messrs. C. H. Karius and I. Champion. They aimed at ascending the Fly River, crossing the central mountain range and following down the Sepik to the sea. It was reported that they had reached Macrossan Island on the Fly River. From a telegram in *The Times* of January 27 it appears that this first attempt to cross New Guinea failed, but that a later expedition has been successful. Messrs. Karius and Champion were again the leaders. Leaving Port Moresby on September 16 last, they succeeded in carrying out their former plan, crossed the Star Mountains and descended the Sepik to its mouth. This is the first time that this central mountain range has been crossed in this region, though both the Fly and Sepik rivers had previously been explored. To the *Journal* for May 1926 Mr. Leo Austen contributed a description of a journey to the headwaters of the Fly River, which illustrates the difficulties attending upon travel in this region. The average height of the divide is 6000 feet; the predominant limestone is much dissected into deep valleys and sharp steep ridges, and the forest is dense.

EXPLORATION OF WEST BAFFIN ISLAND

The examination of the southern portion of the west coast of Baffin Island, resulting in considerable rectification of existing charts, is described in the *Geographical Review* for January 1928 by Mr. G. P. Putnam, who organized and led an expedition there last summer. A survey of the physiographical and glaciological features is added by Prof. L. M. Gould. The party left Rye, N.Y., in June in the *Morrissey*, commanded by Capt. R. A. Bartlett. The season in the Arctic was late, and much ice was met off the Labrador coast. Great difficulty was experienced in rounding Cape Chidley, and during enforced repairs to the vessel, some exploratory work was done on the coast. In Hudson Strait conditions were equally adverse, and nineteen days were spent in passing

Resolution Island. Finally three members of the party were put ashore for research work at Cape Dorset, and the *Morrissey* reached Mill Island. This previously unvisited island was circumnavigated in the whale-boat, and the existence of two separate islands as reported by Capt. Luke Foxe in 1631 was established. Bad weather during the visit prevented positions being determined. Mr. Putnam proposes that the name originally given to the passage by Foxe, "Hurin's Throughlet," should be restored. Mill Island, lying along a N.W.–S.E. axis, of rounded crystalline rocks but recently uncovered by the ice, rises abruptly to a height of over 500 feet. It has undergone much fracturing, the faults being in places at right angles to each other. There is much evidence, including a series of ten terraces, that the island has risen from complete submergence during post-glacial time. On the south coast of Foxe Land also a checker pattern of faults can be traced, particularly around Chorkbak Inlet. The latter was for the first time explored and mapped on the return journey. Cape Dorchester was reached on August 4, and a party organized to explore the coast-line to the east and north in the whale-boat. A subsequent determination of the position of Cape Dorchester showed that it has been placed too far north, and the reconnaissance survey, based upon four astronomical positions, showed the existence east of the Cape of a hitherto uncharted extension of Foxe Basin to the south-east. A base camp was established about 75 miles to the east near the point where the coast runs north again. Besides examining the coast for 100 miles to the north, a journey was made inland about 50 miles to a limestone tableland. Beyond Cape Dorchester the character of the country is in sharp contrast to the rugged and forbidding southern coast; for the 75 miles eastwards no elevation of 50 feet was seen within a dozen miles of the shore. From this low granitic shore all traces of structural control have been removed by the ice-sheet: for miles its margin is littered with old and dirty ice carried up by the tides, which here have a range of almost 30 feet. Towards the eastern end some low 100-feet hills appear, but from here inland to the limestone mesa extends a very recent coastal plain, marshy and lake strewn, covered with grass and moss, apparently supporting large numbers of caribou. The limestone forms a barren tableland about 700 feet high. Fossils were plentiful here. Heavy erosion has broken up the face of the scarp, and has also removed most signs of ice action. It was evident that its foot had recently been washed by the sea. The coast trending north is also extremely level, muds and gravels with limestone base predominating. On August 25 the party returned to Cape Dorchester. While this reconnaissance was being carried out, Capt. Bartlett cruised in Foxe Basin to the entrance to Fury and Hecla Strait, collecting oceanographical data.

"WOODLAND-STEPPE" IN THE NORTH TEMPERATE ZONE

A recent publication of the Geographical Institute of Königsberg University deals with the distribution and characteristics of that type of natural region intermediate in the temperate zone between the steppe and the forest. The three main regions in which it is represented are in Western Siberia, Russia and North America. The author, Dr. S. Funk, terms it "Waldsteppenland," and is at pains to show that it is much more than a more or less indefinite border-line between two major regions. His study brings out forcibly its transitional character in all respects, a character which, as the author's opening sections show, makes it difficult to delimit it exactly. He is apparently dependent largely upon the observations of travellers in describing its superficial extent. In Siberia it extends approximately from the Ural Mountains in latitude 55° N. to the wooded foothills of the Altai west of Lake Baikal, in-

cluding to the south the Baraba and Kulunda regions. West of the Urals it lies south of the line Kazan–Chernigov–Kiev as far as Samara, Saratov and Poltava, thus including the black earth region. The North American region, very approximately, extends west of the Mississippi over the Great Plains, the northern and southern limits being the Lake of the Woods and Northern Texas. Though certain characteristics are common to each, it is equally impossible to define these narrowly. One broad feature is their generally flat surface seldom relieved by more than low hilly country—the result of similar geological histories, though the peneplains of America and Russia are to be distinguished from the Siberian region of continuous depression. Besides the ordinary erosion influences, glacial action, as in the drift areas of the North American section, has modified the surface forms, though these are never sufficient to affect local climatic conditions. The climate is also best described as transitional. In contrast with the Steppe the " Waldsteppenland " has no marked dry season, and differs from the forest region in the greater periodicity of precipitation, marked by an early summer maximum, and in the violence of the rainfall. Other characteristics are the marked contrast between summer and winter, evidenced by the continental range of temperature.

The vegetation is also transitional: the components in the main being the forest trees and the grasses of the steppes. The trees, lining the river-beds and distributed in clumps of various sizes over the plains, appear to have invaded the area with the advent of the present sub-Atlantic climate, and but for the action of man would probably have established themselves more completely. Though at first sight this type of region seems to present a favourable environment for early man and particularly for the development of agriculture, being free from the barriers to movement of the dense swampy forests, actually the nomads of the steppes confined the agriculturalists to the forest belts. The nucleus of the early Russian state, through the ravages of the Tartars, developed in the northern forests. All stimulus to the development of the " woodland steppes " has come from the outside, and to-day they are the grain-producing areas of the world. Influences other than environmental have led to differences in the method of exploitation: in America the farm is the unit with modern cities as centres; in Russia it is the village, of varying type, the equivalent of the city being simply an enlarged village.

CONGRESS OF SLAV GEOGRAPHERS AND ETHNOGRAPHERS

The geographical congress held in Poland during the first half of June 1927 was the second biennial meeting of the Association of Slavonic Geographers and Ethnographers. It was a travelling congress attended by more than two hundred members who were lodged in the Congress train, and by many more local members in the various centres. All the Slav countries, including Russia, were represented, and there were also members from Britain, France, Italy and some other countries.

A large number of papers were presented at the meetings, most of which dealt with some aspects or areas of the Slavonic countries. The papers were in any one of the Slav languages, or in French (a minority); and any estimate of this work must await the appearance of the volume of " proceedings " which is to be published.

A principal object of the Congress, which was generously aided by the Polish Government, was to enable the members to see as much of Poland as was possible in a fortnight—an object which was attained. The first day's programme included morning meetings in Katowice, afternoon excursions in the neighbourhood, and a full reception in the evening. During the night the

train was taken to Posen, where a similar programme was gone through. The third day was spent at Gdynia and on the Baltic shore. Then two days were given to Warsaw, whence the Congress moved to Vilna; and one full day was occupied by a journey from Vilna to Lemberg along the eastern borderland, broken by short excursions at Luniniec and Sarny. Thence the route lay along the Carpathian foreland—with a visit to the oilfield of Boryslaw and a day in the Tatra—to Cracow, where the final meetings were held. The guide-book and collection of maps presented to each member formed a very valuable commentary on the geography of the country and helped to make the excursions of great value.

Among the most vivid impressions of a crowded fortnight are the contrasts between the busy and populous industrial districts of the south-west and the empty desolation of the Pripet marshes, and between the Carpathian Mountains and the general flatness of most of Poland. Then there is the smooth dune coast with its pine forests on the peninsula, and across the bay the new port of Gdynia founded literally on sand, just off the delta of the Vistula, where the obstacles of blowing sand and uncertain foundations are being attacked with great energy in the effort to make a port which shall be wholly Polish. In the north-east the latter half of the journey to Vilna lay through a vast pine forest on the sandy plain which seemed almost uninhabited; but the approach to Vilna through the hills of the great Baltic moraine offered the first change from the somewhat monotonous relief of the great plain. Vilna itself is situated in a fertile area at a node of far-reaching glacial valleys intersecting the moraine belt, and is a focus of routes from east and south-east towards the Baltic. It was in appearance the most mediæval town visited; and the narrow irregular streets roughly paved with glacial boulders contrasted strangely with its well-laid-out modern railway station; the many magnificent churches dedicated to all the faiths of Europe—Catholic (Roman, Orthodox and uniat), Protestant (Lutheran and Calvinist), Muhammadan and Hebrew—witness to the clash of cultures and peoples in this borderland region, a clash to which Lemberg bears similar witness.

Luniniec, on the so-called peninsula of Pinsk in the midst of the Pripet marshes, is perhaps one of the most primitive towns of Europe. It is now a railway junction; but before the railways came it was isolated among the marshes, and modern life is only just reaching it. It is almost wholly a town of wooden one-storey houses, the market centre of a poor countryside, with narrow board walks by some of its broad unpaved streets, many of its people either barefooted or shod with straw or wooden sandals. Its most prominent buildings were the railway station and the new school: a statement true also of many other small towns seen by the way, where these buildings bear witness to the rebirth of a nation.

Lemberg, the capital of Galicia, occupies an interesting site on the ridge between the valleys of the Dniester and the Bug. Like Vilna, it was an outpost of Polish expansion, and is a meeting-place of peoples and cults; though it is much less mediæval in its street plan and paving.

The Carpathian foreland in South Poland is a region of dissected plateaus with a variety of soils and relief which makes it a striking contrast to the rest of the country. It is much richer agriculturally, as well as in minerals, and appeared the most prosperous region. The oilfield of Boryslaw emphasized the mixture of old and new which characterizes Poland of to-day: it was more reminiscent of a colonial mining camp than of any well-settled town.

These brief notes indicate only a little of the work involved in the organization

of the Congress, and the fact that so ambitious a programme was carried through without a hitch is the best testimony to the efficiency of the organization. All the visitors have carried away a very high appreciation of the abilities, the courtesy and the lavish hospitality of their hosts.

INTERNATIONAL GEOLOGICAL CONGRESS, PRETORIA, 1929

The Fifteenth International Geological Congress was held in 1929 in Pretoria, at the invitation of the Government of the Union of South Africa. The Honorary President will be the Premier of the Union, and the President Mr. A. W. Rogers, Director of the Geological Service. The Congress will meet from 29 July to 12 August 1929. Three special subjects for discussion have been provisionally selected—the differentiation of magmas, the glacial periods anterior to the Pleistocene, and the stratigraphy, palæontology, and distribution of the Karroo system, and the Organizing Committee have decided to issue a special monograph upon the gold resources of the world. The meeting of the Congress in South Africa affords an opportunity for geologists to study a comparatively little-known country, so that numerous excursions have been planned. Before the Congress two long excursions will be made, to the most interesting areas of Cape Colony, and to Kimberley and Johannesburg, the latter especially for mining engineers. After the meeting there will be three alternative trips, to Vredefort, to Devil's Kantoor for the great eastern escarpment of the Transvaal Drakensberg, to Stormberg for the stratigraphy of the Karroo, and to the Bushveld Complex, across Sekukuniland. It is also hoped to arrange a visit to Southern Rhodesia. Applications, papers, etc., should be addressed to the General Secretary, XV International Geological Congress, P.O. Box 391, Pretoria.

WELTLAGERSTÄTTENKARTE: CORRECTION

The price of this work was wrongly given in the review on p. 98 of the January *Journal*. The subscription price before publication was M.80, but the published price is M.120.

OBITUARY

ARNOLD LOUIS MUMM

On 2 December 1927 Arnold Louis Mumm died on the P. & O. liner *Kashmir* and was buried at sea off Casablanca (Morocco). He was returning from the Far East, where, in the course of a leisurely trip round the world he had revisited Japan and spent some time in Korea. Though his health had given anxiety for some months the news of his sudden death came as a shock to a large circle of friends, who found in Mumm's character a charming union of simplicity and gentleness, broad views and wide interests, combined with those very high scholarly and literary attainments which he so eminently possessed.

He was born on 23 September 1859 at 4, Hyde Park Street, the home of Julius von Mumm, of the well-known Frankfort family. His mother, to whom he was devoted during her long widowhood, was Elizabeth Henry of Dublin. Perhaps as a result of this ancestry Arnold entered College at the top of the list at Eton in 1871, and had a distinguished classical record. His younger brother Bernard, afterwards killed in a steeplechase while serving with the 7th Hussars in India, was also in College. Arnold played in College and Mixed Wall, and was a sound cricketer. His early literary bent was signalized by his two years' editorship of the *Eton College Chronicle*. Winning a scholarship at Corpus he went up to Oxford in 1879, and obtained three " firsts "—

Mods, Greats, and Law. He was called to the Bar in 1886; but finding himself unable to overcome an inborn incapacity for public speaking, he joined the publishing firm of Mr. Edward Arnold, where his wide reading and informed literary taste found successful scope. During the War he served continuously in the Special Constabulary, receiving the Police Medal on its conclusion.

Though not really robust he was devoted to outdoor sports, shooting constantly in his youth over the celebrated Loch Kinord moors. In later years he was fond of rough winter shooting in Scotland. But it was to mountaineering and mountain travel that he was particularly attracted. He had no remarkable ascents to his credit, but his attitude and achievements in the Alps are typified by his ascent of the Titlis in 1925, just fifty years after he had first ascended it as a boy. Elected to the Alpine Club in 1889 he served it with devotion, being Honorary Secretary from 1901 to 1906, and Vice-President from 1919 to 1921. Besides many seasons in the Alps he also visited the little-known ranges of Hercegovina, and made several expeditions to the mountain ranges of Canada, where he endeared himself to the members of the Canadian Alpine Club, at whose summer camps he was a guest on several occasions. In 1905 he accompanied his old friend Mr. Douglas Freshfield to Africa, where in atrocious weather they explored the approaches to the then unconquered peaks of Ruwenzori. In 1907, the jubilee year of his beloved Alpine Club, he provided the chief sinews of war for a reconnaissance to Mount Everest with Major (now General) the Honble. C. G. Bruce and the writer. But after satisfactory arrangements had been made in India this plan was vetoed by the India Office, which led to a spirited protest in *The Times* by our late President Sir George Taubman Goldie. The party then transferred their activities to Garhwal, where, although Trisul was the only peak actually climbed, they had a most successful season of glacier exploration, extending right up to Kamet on the Tibetan border. Later in the season he visited Kashmir and Khagan. This journey of mountain exploration has been delightfully chronicled by him in 'Five Months in the Himalaya' (London, Arnold, 1909). Recently he made long visits to Petra with his old friend Sir Alexander Kennedy, where his practical experience as a photographer found great scope and his classical learning a fruitful employment.

His charm of character and invariable good humour under the discomforts of mountain travel, often aggravated by indifferent health, endeared him to all with whom he had ever travelled: amongst a still wider circle of friends he will be sorely missed. T. G. L.

ON THE USE OF THE INITIALS DENOTING FELLOWSHIP OF THE SOCIETY

At the Evening Meeting of 20 *February* 1928 *the President made the following statement:*

It has come to the notice of the Council of the Royal Geographical Society that, during the course of a recent lawsuit, the question was raised, whether it was desirable that Fellows of learned societies should place after their names the letters signifying their Fellowship. Amongst the Societies named was the Royal Geographical Society, and the Council therefore think it desirable to make the position clear as regards this Society.

The Charter granted to the Society in the twenty-second year of the reign of Queen Victoria, speaks in the preamble of Members: declares that "such of our loving subjects as are now Members of the said Society, or shall from

time to time be elected Fellows thereof . . . shall . . . be one body politic and corporate . . ." and thereafter calls them Fellows. Thus every Fellow has the undoubted right to style himself a Fellow and to place the letters F.R.G.S. after his name when the circumstances are suitable. It is to be remembered that, in common with most learned Societies, the Royal Geographical Society is composed of those who have done original work and have advanced, the subject by their own efforts: and, in addition, of those who are interested in the subject and are desirous of supporting the Society's work and of keeping in touch with that branch of knowledge to which it is devoted. These two categories of Fellows form a united society, and no distinction is drawn between the two, nor is it intended to draw any such distinction, for the two categories merge one with the other.

The Society was founded for the Advancement of Geographical Science. In its life of ninety-eight years it has been able, from the annual subscriptions of its Fellows, to spend many tens of thousands of pounds in exploration and survey, in costly publication of scientific results, in forming a great library and map collection indispensable to students, in helping to establish Schools of Geography in the Universities, and generally in advancing the science of geography to the utmost means. Such a work cannot be supported from the private means of relatively few specialists. It needs large resources which, in default of endowments or of great contributions from public funds, must be supplied by the annual subscriptions of a large Fellowship.

It is not true, as has been stated recently, that any one can become a Fellow of the Royal Geographical Society on payment of a guinea. A candidate for election must be proposed as suitable from personal knowledge by one already in the Society, and seconded by another, with a statement of the candidate's interest and qualifications for Fellowship. The election rests with the Council, and is not a matter of form. On election a Fellow pays an entrance fee of five pounds and thenceforward an annual subscription of three.

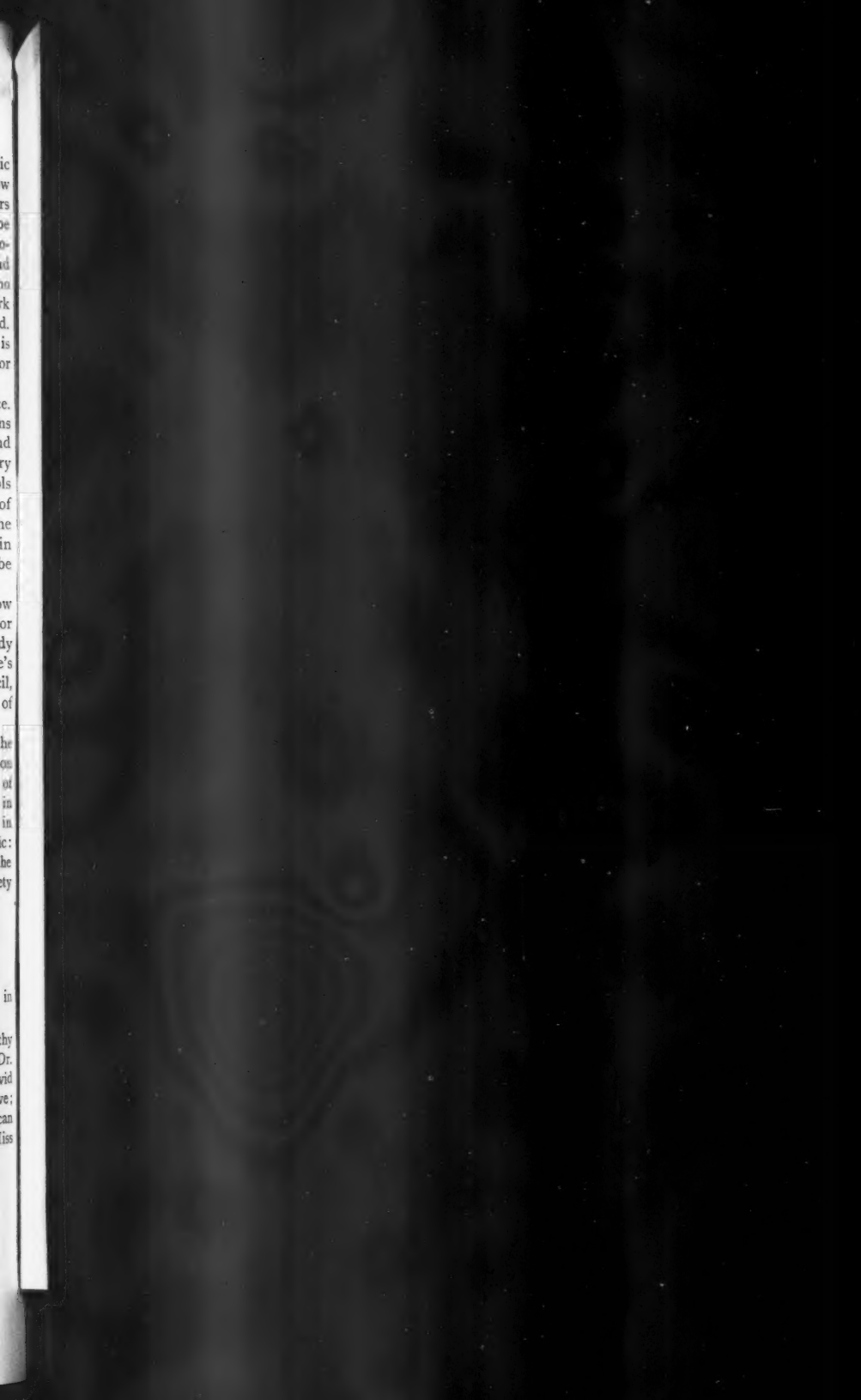
The Council is satisfied that any Fellow is fully entitled to make use of the letters F.R.G.S. when he legitimately desires by so doing to call attention to the fact that he belongs to a fellowship interested in the progress of Geography. He would be quite justified, for instance, in using the letters in books of reference to show his scientific interests. The use of the letters in other circumstances must be guided by good taste. The title is not honorific: its purpose is not to convey a distinction, but to indicate a fellowship, in the old established and customary sense of membership of a scientific Society incorporated by Royal Charter.

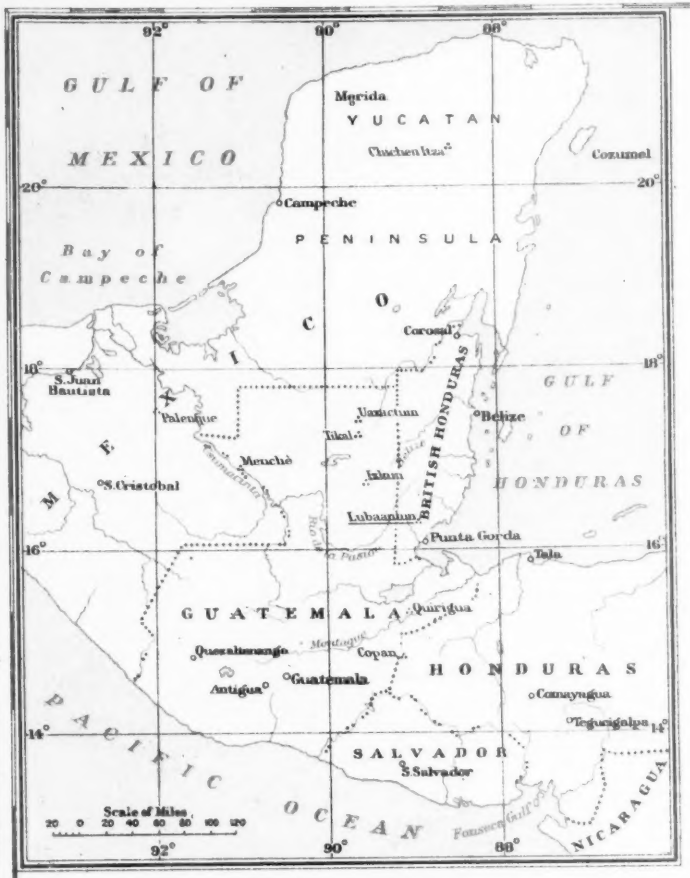
MEETINGS: SESSION 1927–28

Seventh Evening Meeting, 6 February 1928. Sir Charles Close, President, in the Chair

Elections: Harry Catlin; Capt. E. H. M. Clifford, M.C., R.E.; Miss Dorothy Currie; Rustom Dadiba Dalal; Donald Gray; William Herbert Hoy; Dr. L. D. Livingstone; Major-Gen. Sir Charles MacWatt, C.I.E., I.M.S.; David Willett Fleetwood Dallin Paul; H. Talbot S. Pearch; Charles Robert Reeve; Charles Cleverton Saunders, B.A.; Edwin Duncan Stansfeld, B.A.; Duncan Stevenson, B.SC.; Neil Stuart Stevenson, B.SC.; Capt. Kenneth Storey; Miss Gertrude Thorp; Capt. M. A. Warters, I.M.S.; Robert Watson.

Paper: In Portuguese West Africa. By Mr. T. Alexander Barns.





89° 00'

Esperanza
Lat 16° 25' 25" N.
Long 89° 01' 34" W.

This map is from Mr Laws' prismatic compas
by planetabling, and adjusted to his astronom
Latitudes are from the means of circummeri
stars, and Longitudes from E and W stars fr
The star observations were made with a 6-i
Heights are from aneroid readings and vert
In parts Mr Laws has made use of previously
material, supplied by the Surveyor-General o
Forests.

AREA OF UNDERGROUND DRAINAGE

Grande

Spring (dry)

Lubaantun
Lat. 16° 16' 52" N.
Long 88° 57' 54" W.

San Pedro Colombia

Columbia Branch

San Antonio

Rio Blanco

San Antonio Viejo

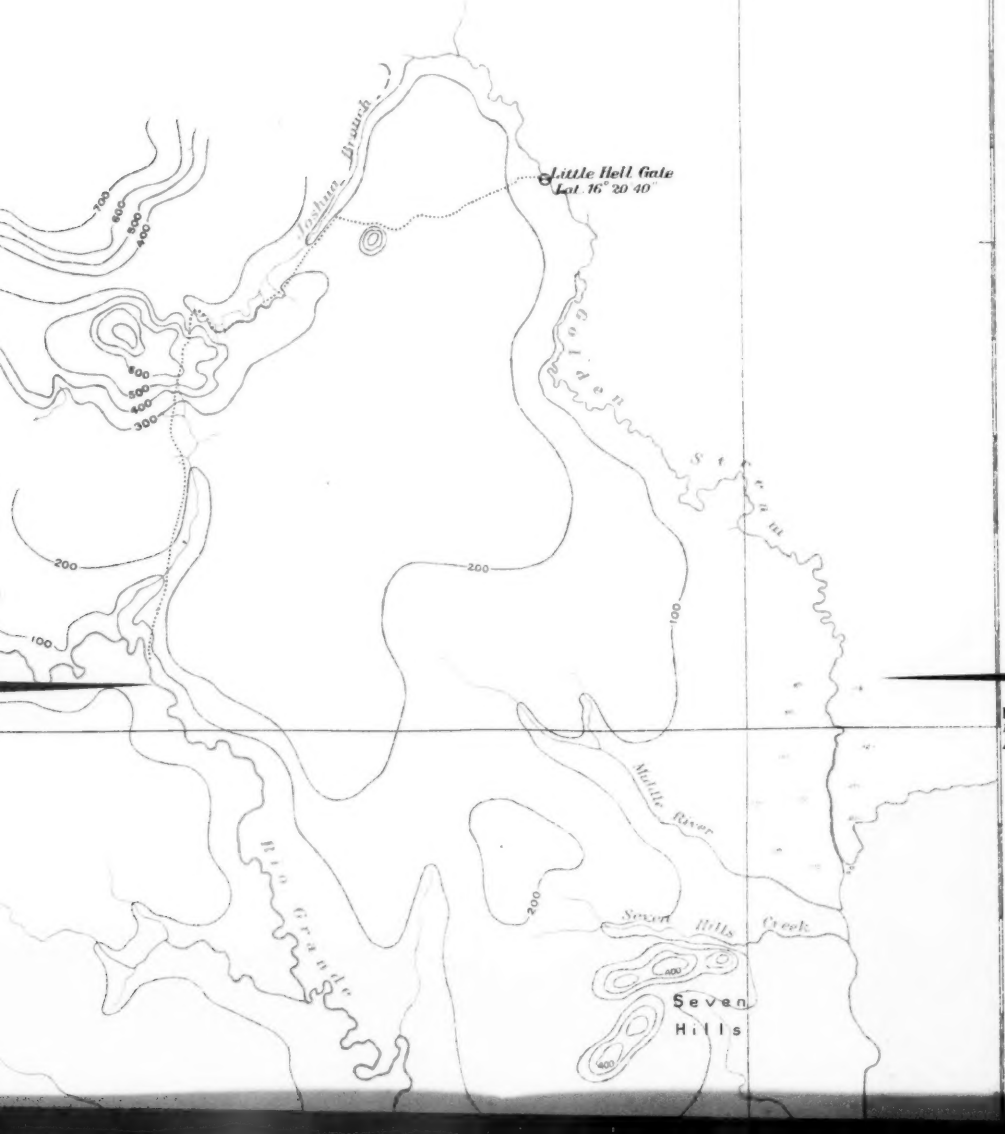
Motagua

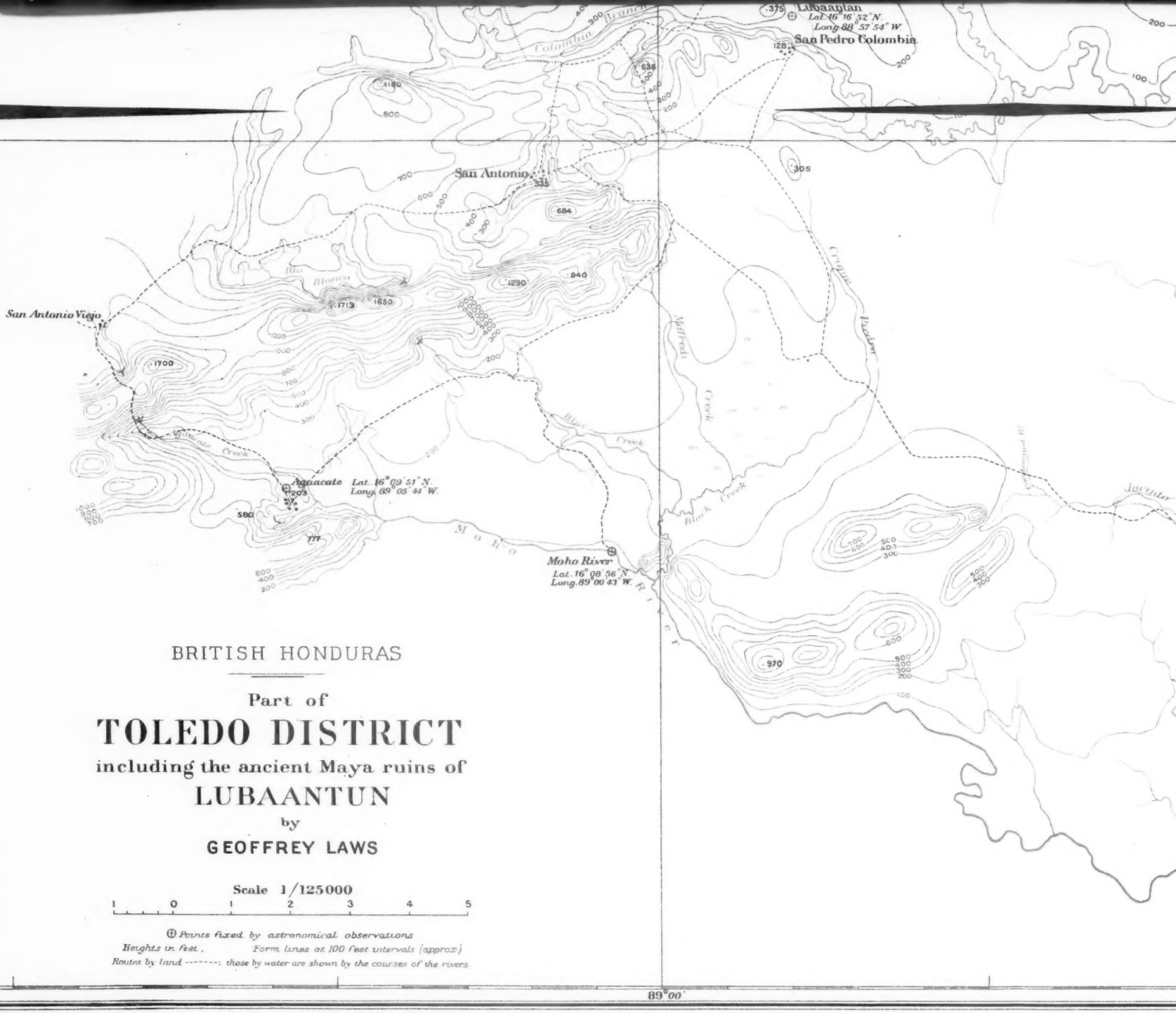
Polochic

16° 15' N

88°45′

natic compass traverses, supplemented
s his astronomically determined positions.
f circummeridian altitudes of N and S
nd W stars for L.M.T. with G.M.T. by wireless.
e with a 6-inch micrometer theodolite.
ngs and vertical angles.
of previously existing cartographical
or-General and the Conservator of





BRITISH HONDURAS

Part of

TOLEDO DISTRICT

including the ancient Maya ruins of

LUBAANTUN

by

GEOFFREY LAWS

Scale 1/125000

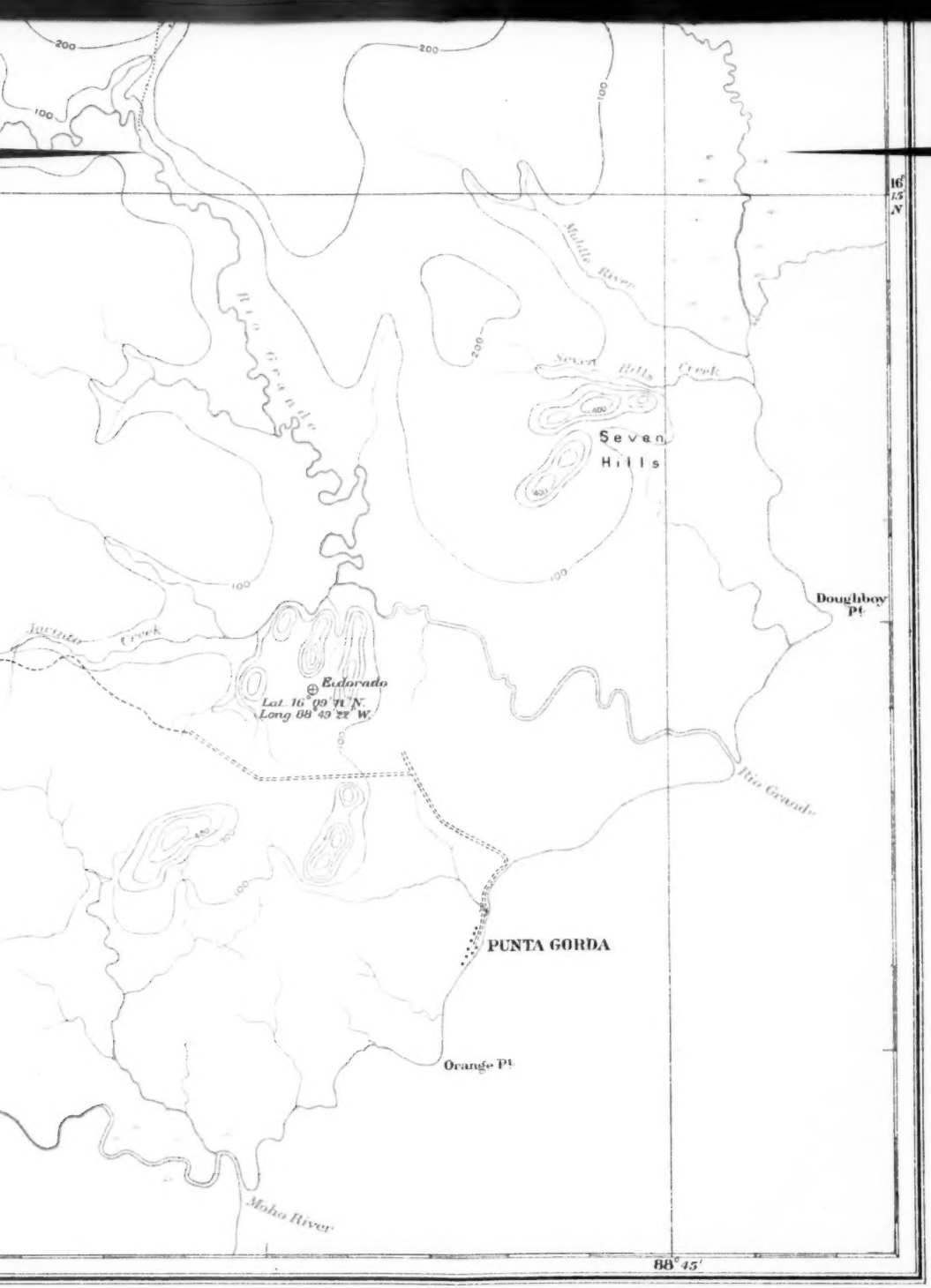
1 0 1 2 3 4 5

⊕ Points fixed by astronomical observations

Heights in feet. Form lines at 100 feet intervals (approx)

Routes by land --------; those by water are shown by the courses of the rivers

Published by the Royal Geographical Society



LUBAANTUN - BRITISH HONDURAS

Laws